

IN THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

CASE NOS. 14-1175, 14-1177

ON APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO, EASTERN DIVISION

District Court Case Nos. 12-CV-00223, 13-CV-00572
Judge Donald C. Nugent

SHIELDMARK, INC.,

Plaintiff-Appellant,

v.

INSITE SOLUTIONS, LLC,

Defendant-Appellee.

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CERTIFICATE OF INTEREST

Counsel for appellant certifies the following:

1. The attorneys listed below represent appellant ShieldMark, Inc.
2. ShieldMark, Inc. is the real party in interest.
3. There are no parent corporations or publically held companies that own 10 percent or more of the stock of ShieldMark, Inc.

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STATEMENT OF RELATED CASES

No other appeal in or from the same civil action or proceeding in the lower court or body was previously before this or any other appellate court. No other case is known to counsel to be pending in this or any other court that will directly affect or be directly affected by this court's decision in the pending appeal.

JURISDICTIONAL STATEMENT

This Court has jurisdiction of this appeal from final judgments of the U.S. District Court for the Northern District of Ohio in patent infringement cases. The district court had jurisdiction over this action pursuant to 28 U.S.C. §§1331 and 1338(a), and the case was an action for patent infringement arising under the United States patent laws, 35 U.S.C. § 271 *et seq.* The district court entered final judgment in Case Numbers 12-223 and 13-572 on November 20, 2013. JA, pp. 1 – 20. This timely appeal was filed on December 19, 2013. JA, pp. 394 – 399. This Court has jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

STATEMENT OF THE ISSUES

- I. Whether the district court erred in construing the claim term “double-sided adhesive layer” in Claim 2 of the ‘480 Patent as meaning “a layer of non-adhesive material with adhesive on both sides” instead of the plain meaning that the layer, whatever its makeup, had to be sticky on both sides?
- II. Whether the district court erred in concluding that there was no genuine issue of fact with respect to whether InSite’s product literally infringed on the claim limitation “double sided adhesive layer” in Claim 2 of the ‘480 patent?
- III. Whether the district court erred in applying the concept of claim vitiation to preclude ShieldMark from establishing infringement of the claim limitation “double sided adhesive layer” in Claim 2 of the ‘480 Patent by application of the doctrine of equivalents?
- IV. Whether the district court erred in granting summary judgment where genuine issues of fact existed with respect to application of the “function-way-result” test to determine whether InSite’s product infringed on the claim limitation of “double sided adhesive layer” in Claim 2 of the ‘480 Patent?
- V. Whether the district court erred in granting summary judgment on the claim limitation of “substantially uniform thickness” in Claim 5 of the ‘480 Patent and Claim 1 of the ‘292 Patent where there were disputed facts and conflicting declarations regarding whether there were “significant deviations, protrusions, or steps” in InSite’s product?

STATEMENT OF THE CASE

The application for the ‘480 Patent was made on September 29, 2003, and it was granted January 3, 2012. See Joint Appendix (“JA”) at p. 21. The Abstract indicated:

The adhesive tape of this application comprises a layer of polymeric material, particularly a polyvinyl chloride, having a Shore A Hardness of between 92 and 100 and a layer of adhesive material attached to a surface of the layer of polymeric material.

JA, p. 21. The application was for an “Adhesive Tape” which provided “superior ductility, strength, tear resistance and abrasion resistance.”

JA, p. 23 at Background. The Adhesive Tape was designed for factory and industrial environments, which have not been receptive to pressure sensitive adhesive tapes in the past due to wear, appearance, and detaching. *Id.* One aspect of products made under the claims of the ‘480 Patent is the ability to rise above many of the problems of similar adhesive tapes at the time of the invention which “lack sufficient strength and hardness to prevent wearing, tearing, cracking and breakage from heavy traffic,” in addition to poor adhesive quality. *Id.*

The two relevant independent claims in the ‘480 Patent are described below.

Claim 2¹ describes “[a]n adhesive tape for application to a flooring environment comprising:

a polymer layer having a thickness between 0.020” and 0.065”, the polymer layer defining a first side; and

a double sided adhesive layer where one side of the double sided adhesive layer is in substantially continuous contact with the first side of the polymer layer and an opposing side of the double sided adhesive layer is disposed to adhere to the flooring environment;

where the adhesive tape has a peel adhesion greater than 2.0 lb/in width, measured under a test method including peeling the tape at a 90 degree angle after application to a stainless steel panel.

JA, p. 24

Claim 5 describes “[a]n adhesive tape comprising”

a polymer layer having a Shore A Hardness of between 92 and 100 and a substantially uniform thickness of between about 0.020” to 0.065”; and

¹ On December 3, 2013, shortly after the district court’s judgment of non-infringement, the U.S. Patent and Trademark Office issued Reexamination Certificate 9969 upholding the patentability of claims 1, and 4 – 13 and cancelling claims 2 and 3. JA, p. 392. Upheld claim 4 depends from claim 2 and calls for “The adhesive tape as set forth in claim 2, further comprising a substantially planar floor adhered to the adhesive on the opposing side, where the adhesive tape provides an aisle marking system.” InSite does not dispute its accused products are used on floors to provide an aisle marking system. Accordingly, the presence in the accused products of a “double sided adhesive layer” as construed in claim 2 remains dispositive of confirmed claim 4.

a layer of adhesive attached to said polymer layer;

where the adhesive tape comprises a peel adhesion greater than 2.0 lb/in width when peeled at a 90 degree angle under a modified PSTC-1-1 method where the modified PSTC-1-1 method comprises a dwell time of one hour.

Id.

The ‘292 Patent is a continuation of and claims priority to the date of the filing of the ‘480 Patent. The two patents have the same inventor, assignee, specification, and drawing. Claim 1 of the ‘292 Patent claims a method of making a product of the ‘480 Patent. Both Claim 5 of the ‘480 Patent and Claim 1 of the ‘292 Patent have similar claim limitations of a “polymer layer having . . . a substantially uniform thickness.” JA, pp. 24 and 31.

When ShieldMark first began marketing its patented product, the Defendant/Appellee became a distributor and touted the innovation of ShieldMark’s adhesive tape to its customers. After several years as a ShieldMark distributor, however, InSite introduced a copycat product to market to its customers who had been purchasing ShieldMark’s adhesive tape. The benefits InSite touted in its new product compared to previous inferior products were the same as those it had attributed to ShieldMark’s adhesive tape. InSite went so far as to use unattributed

pictures of ShieldMark's product in its marketing materials of its own version of adhesive tape.

But in an apparent effort to head off claims of infringement, InSite introduced some minor changes in its copycat product which are now central to its defense in this action. For one, InSite introduced an adhesive applied directly to the polymer layer instead of a carpet tape as described in one embodiment in the specification in the '480 Patent. According to Dr. Jerry Serra, this difference serves no purpose in the use of the product. Second, InSite copied ShieldMark's actual product by tapering the edges of its polymer layer, although the Patents themselves are silent on this feature. Dr. Jerry Serra testified that the tapering edge feature was insignificant to the uniform thickness of the tape. It is these two nonfunctional features that the Court below found were a sufficient basis to conclude that InSite's copycat products do not infringe ShieldMark's patents.

Case No. 1:12-CV-223

On January 30, 2012, plaintiff ShieldMark, Inc. filed a complaint against Insite Solutions, LLC with a jury demand alleging patent infringement. JA, p. 51 - 53. The complaint alleged that ShieldMark

owned U.S. Patent No. 8,088,480 entitled “Adhesive Tape” (hereinafter, “the ‘480 Patent”), and that InSite made, used, sold, offered for sale, and/or imported adhesive tape and sold it under the names “Superior Mark Tape” and “Last Mark Aisle Marking Tape” that willfully and deliberately infringed on one or more claims of the ‘480 Patent in violation of 35 U.S.C. § 271. *Id.* at ¶¶6-10. ShieldMark sought injunctive relief, damages, attorney fees, and costs.

On March 5, 2012, ShieldMark filed an amended complaint alleging that on July 5, 2005, ShieldMark demanded in writing that InSite cease and desist the making, using, importing, and selling of products claimed in ShieldMark’s application for the ‘480 Patent, U.S. Patent Application No. 10/674,108. (Doc. 4 at ¶7). The amended complaint alleged that defendant had actual notice of the patent application on or before July 5, 2005, and that the claims of the patent application were substantially identical to the claims of the patent. *Id.* at ¶¶8-9.

On May 25, 2012, InSite filed its answer and counterclaim, denying the allegations of the amended complaint, asserting that the ‘480 Patent was invalid and barred by estoppel, and asserting

counterclaims for declaratory judgment, unfair competition, and fraud and/or inequitable conduct.

The parties extensively briefed the issue of claim construction. JA, pp. 80 – 101; 102 – 134; 135 – 144; and 145 – 158. Relevant to this appeal, the principal terms requiring construction were “double sided adhesive layer,” referenced in independent Claim 2 and “substantially uniform thickness” referenced in independent Claim 5. On February 14, 2013, the Court issued an order on claim construction. JA, pp. 159 – 172.

On March 20, 2013, Insite filed a motion for summary judgment, contending that, as a result of the district court’s claim construction, it was entitled to summary judgment. JA, pp. 178 – 203. InSite argued that there was no literal infringement and that the doctrine of equivalents was not available to ShieldMark due to the concepts of prosecution history estoppel.

On May 28, 2013, ShieldMark opposed InSite’s motion for summary judgment, JA, pp. 204 – 229, attaching or incorporating declarations for ShieldMark’s expert Dr. Jerry Serra JA, pp. 77 – 79;

Cheryl Saqqa JA, pp. 69 – 74; and the prosecution history of the case, as well as other evidence. See, JA, p. 204.

On November 20, 2013, the district court granted summary judgment of non-infringement in favor of InSite giving rise to this appeal. JA, pp. 1 – 20.

Case No. 1:13-CV-00572²

About a year after its first complaint, ShieldMark filed a second complaint against InSite alleging violation of U.S. Patent No. 8,343,292 issued on January 1, 2013 (hereinafter, “the ‘292 Patent”), alleging that InSite manufactured and sold an infringing product which competed with ShieldMark’s adhesive tape sold and marketed through its domain name <www.MightyLine.net.> JA, pp. 173 – 177 at ¶¶ 7-8.

ShieldMark alleged that it had marketed its product since 2006 and

² Although the district court in Case No. 13-572 initially denied a motion to consolidate the cases, Case 13-572 was transferred on July 18, 2013 to the district judge to whom Case No. 12-223 had been assigned, after the court found that the two cases “involve the same parties and the same allegedly infringing products, thereby making consolidation the prudent course of action.” (Doc. (572) 14). The district court resolved both summary judgment motions in the same Memorandum of Opinion, never differentiating between the cases and considering the decision on the ‘480 Patent, which is the subject of Case No. 12-223 dispositive of issues raised by U.S. Patent No. 8,343,292 in Case 13-572. (Doc. 93).

that defendant InSite had been a distributor of ShieldMark's adhesive tape covered by the '292 Patent. *Id.* at ¶¶9-10. InSite had access to ShieldMark's patented technology and pricing information, and became a direct competitor of ShieldMark. *Id.* at ¶¶11-12. The complaint alleged that InSite's "Superior Mark" tape incorporates key features of the ShieldMark patent, and that InSite made, used, sold, offered for sale, and/or imported its "Superior Mark" adhesive tape that infringes on at least claims 1 – 3 of the '292 Patent. *Id.* at ¶¶13-14. Based on information obtained from ShieldMark, InSite was able to price its products so that it unfairly competed with ShieldMark's Mighty Line tape. *Id.* at ¶16. After InSite started selling its "knock off" tape, the sales of ShieldMark's products declined. *Id.* at ¶17. The complaint alleged that the conduct of InSite was willful and deliberate. *Id.* at ¶22.

On September 11, 2013, InSite filed a motion for summary judgment of non-infringement, asserting that the district court's construction of the claims in Case No. 12-223 required summary judgment in InSite's favor. JA, pp. 242 – 247. On October 14, 2013, ShieldMark filed its memorandum in opposition to summary judgment,

JA, p. 352 – 366, and the expert report of Dr. Jerry Serra. JA, pp. 367 – 383.

On November 20, 2013, the district court granted the motion for summary judgment by an order which disposed of claims in both cases, giving rise to this appeal. JA, pp. 1 – 20.

SUMMARY OF ARGUMENT

The district court’s decision that Claims 2 and 5 of the ‘480 Patent and Claim 1 of the ‘292 Patent were not infringed was dispositive of all claims in the case. The district court’s erroneous construction of the term “double sided adhesive” in Claim 2 of the ‘480 Patent led to its erroneous ruling that InSite’s product did not literally infringe on this claim limitation. The district court erroneously read a limitation into the construction of the term “double-sided adhesive layer.” Specifically, it construed the term to require “a layer of non-adhesive material” with adhesive on both sides. This construction is contrary to the plain meaning of the words of the ‘480 Patent and the evidence presented. Since the district court’s claim construction required a “layer of non-adhesive material” – an element absent from InSite’s product – the

district court's claim construction essentially granted summary judgment for InSite on the issue of literal infringement.

The district court compounded its error by finding that the concept of claim vitiation precluded ShieldMark from arguing infringement of Claim 2 of the '480 Patent under the doctrine of equivalents. Without this erroneous application of the doctrine of claim vitiation, issues of fact would have precluded the district court from granting summary judgment in InSite's favor on the application of the doctrine of equivalents.

With respect to Claim 5 of the '480 Patent and Claim 1 of the '292 Patent, the district court erred in granting summary judgment to InSite on the issue of whether the polymer layer of InSite's product was of a "substantially uniform thickness." ShieldMark presented expert testimony and analysis that 95% of the InSite product was of a "substantially uniform thickness" as construed and within the ranges specified. ShieldMark's expert also testified that the small change in thickness did not affect the function of the tapes and was therefore not significant in that sense as well. Although this was a factual issue, the

district court, in the face of conflicting evidence, resolved the disputed facts and granted summary judgment for InSite.

ARGUMENT

STANDARD OF REVIEW

Orders granting or denying summary judgment are reviewed *de novo*, and should be affirmed only when “there is no genuine issue as to any material fact and . . . the moving party is entitled to a judgment as a matter of law.” *Crown Operations Int’l v. Solutia Inc.*, 289 F.3d 1367, 1375 (Fed. Cir. 2002). *See Hologic, Inc. v. SenoRx, Inc.*, 639 F.3d 1329, 1334 (Fed. Cir. 2011). This Court “reviews a district court’s grant of summary judgment without deference.” *Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1353 (Fed. Cir. 2012). “At the summary judgment stage, we credit all of the nonmovant’s evidence and draw all justifiable inferences in its favor.” *Brilliant Instruments, Inc. v. GuideTech, LLC*, 707 F.3d 1342, 1344 (Fed. Cir. 2013).

I. **CLAIM 2 - THE DISTRICT COURT ERRED IN CONSTRUING “DOUBLE-SIDED ADHESIVE LAYER” TO REQUIRE “A LAYER OF NON-ADHESIVE MATERIAL” WITH ADHESIVE ON BOTH SIDES.**

Standard of Review

This Court “review[s] claim construction *de novo* on appeal including any allegedly fact-based questions relating to claim construction.” *Cybor Corp. v. FAS Technologies, Inc.*, 138 F.3d 1448, 1456 (Fed. Cir. 1998) (en banc). *See Lighting Ballast Control LLC v. Philips Electronics N. Am. Corp.*, 2012-1014, 2014 WL 667499 (Fed. Cir. Feb. 21, 2014) (en banc).

Argument

“An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing.” *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996).

“It is well-settled that, in interpreting an asserted claim, the court should look first to the intrinsic evidence of record, *i.e.*, the patent itself, including the claims, the specification and, if in evidence, the

prosecution history. *See Markman*, 52 F.3d at 979, 34 USPQ2d at 1329.

Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005).

“[T]he words of a claim ‘are generally given their ordinary and customary meaning.’” *Id.* “In some cases, the ordinary meaning of claim language . . . may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.” *Id.* at 1314.

Claim terms should not be construed in isolation, but read “not only in the context of a particular claim, but in the context of the entire patent, including the specification.” *Id.* at 1313. Indeed, the specification “is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Vitronics Corp.*, 90 F.3d at 1582.

The construction at issue is of the claim term “double sided adhesive layer” as used in Claim 2, which provides in pertinent part as follows:

An adhesive tape for application to a flooring environment comprising:

* * * *

a *double sided adhesive layer* where one side of the double sided adhesive layer is in substantially continuous contact with the first side of the polymer layer and an opposing side of the *double sided adhesive layer* is disposed to adhere to the flooring environment;

* * * *

JA, p. 24 (emphasis added)).

ShieldMark argued that the plain meaning of the term was a “layer with adhesive on both sides,” while InSite argued that the term required “a substrate having adhesive on opposing or both surfaces.” JA, p. 164. Although the district court rejected InSite’s use of the word “substrate,” the district court imported into the claim term the requirement of a non-adhesive layer, construing the term “double sided adhesive layer” as a “layer of non-adhesive material with adhesive on both sides.” JA, p. 172.

The district court, without reference to any facts, concluded that a “double sided adhesive layer” could not consist of adhesive alone, but must necessarily include some other sort of double-sided material to which adhesive had been applied to both sides. The district court reached this conclusion by making an unsupported factual finding that adhesive, by definition, either cannot constitute a “layer” or does not have “sides.” The court found that adhesive “is an all around amorphous and sticky substance that has no differentiation between a sticky and a non-sticky side” and has “no clear form or shape that could be identified or differentiated as having a single sticky side or being sticky on two sides.” JA, p. 165.

There has been no showing that there is any differentiation between a single sided and double sided adhesive. Therefore, it appears from the evidence and arguments presented that “adhesive” is generally a term for an adhesive

material that is sticky throughout without regard to shape or surface configuration.

JA, pp. 164– 165.³

The court rejected ShieldMark’s argument that a “double sided adhesive layer” meant “a layer of adhesive that is sticky on both sides.” JA, p. 164. The district court held that “the plain meaning of ShieldMark’s proposed language would more logically be explained as a layer (of unidentified material) *with* adhesive on both sides,” *Id.* (emphasis in original).

The district court supported its construction by reference to the fact that other claims in the ‘480 Patent referred to an “adhesive layer,” without calling it “double sided.” For example, Claim 5 calls merely calls for a “layer of adhesive” and Claim 1 (not asserted) calls for a “layer of pressure sensitive adhesive”. JA, p. 24. The district court concluded that:

³ Even assuming that the district court was correct that, as a matter of fact, a one sided adhesive does not exist in the world, and, therefore, the adjective “double sided” is superfluous, this factual conclusion does not require the construction reached by the district court that the adhesive layer referenced in the ‘480 Patent necessarily included a “layer of non-adhesive material.” To completely re-write the claim term based on the speculation that one-sided adhesives do not exist in the world was error.

The ‘480 Patent distinguishes between “a layer of adhesive” and a “double-sided adhesive layer.” The inventor clearly used different terms to describe different concepts related to the adhesive. Claim One and Claim Five, as well as the Patent specification speak of “a layer of adhesive material” and “a layer of pressure-sensitive adhesive material” without any restriction or requirement that the layer is double-sided.”

JA, p. 164. This is clearly a distinction without a difference, and is a hypertechnical reading of the ‘480 Patent which ignores the clear language of the claims.

For example, Claim 1, cited by the district court, claims “a layer of pressure sensitive adhesive comprising a first side and an opposed second side.” The district court asserted that this was evidence that the inventor “used different terms to describe different concepts,” but never explained how a layer of adhesive with two sides (as described in Claim 1) is inconsistent with a “double sided adhesive layer” referenced in Claim 2. JA, p. 164.

The district court held that if it adopted ShieldMark’s preferred construction - “a layer with adhesive on both sides” – then the references in Claims 1 and 5 “would be rendered superfluous.” JA, p. 165. The district court held that to adopt ShieldMark’s construction would:

render the disputed term superfluous and provide no contrast to the clearly different language chosen to describe the adhesive layers in other claims of the Patent. The only way to give meaning to the term “double sided adhesive layer,” and to differentiate it from the term “layer of adhesive material,” is to accept InSite’s construction of the term which requires that an adhesive be present on both sides of a center layer of non-adhesive material.

JA, p. 166. This construction is incorrect in light of the fact that Claim 1 makes specific reference to “a layer of pressure sensitive adhesive comprising a first side and an opposed second side,” and Claim 5, interpreted in light of the entire specification, could mean nothing other than that the adhesive layer was sticky on each side.⁴

Tandon Corp. v. U.S. International Trade Commission, 831 F.2d 1017 (Fed. Cir. 1987), cited by the district court, does not require a different result. In *Tandon Corp.*, the first claim in a patent for double-sided floppy disk drives made reference to “a first transducer” while the

⁴ The district court also rejected InSite’s definition of “double sided adhesive” which required that the adhesive be attached to a “substrate” or “a thin protective strip of material that is attached to adhesive to prevent the adhesive from undesirable adhering to items during storage or transport; the strip is intended to be removed and thrown away; such is often referred to as a ‘release liner.’” JA, p. 166. The court held that “substrate” implies “a specific location” and that the material holding the adhesive in Claim 2 “does not appear to be intended as a release liner.” *Id.* Accordingly, the court rejected InSite’s definition which included a “substrate.”

fifth claim made reference to “a first non-gimballed transducer.” *Id.* at 1021-22. Tandon argued that “since claim 5 expressly describes the first transducer as non-gimballed, claims 1 and 12 must be read as encompassing a gimballed first transducer,” arguing that “the ‘doctrine of claim differentiation’ prevents reading into claims 1 and 12 this limitation of claim 5,” *Id.* at 1023. The Commission held that despite the fact that not all claims used the word “non-gimballed,” it was clear from the language of the claims that the transducer was to be “fixed,” since the three claims in issue – 1, 5, and 12 – all used the phrases “relatively fixed,” “fixed,” and “fixedly coupled.” *Id.*

This Court affirmed, noting that “[c]laims are always interpretable in light of the specification that led to the patent.” *Id.* “Whether or not claims differ from each other, one cannot interpret a claim to be broader than what is contained in the specification and claims as filed.” *Id.* at 1024. “Thus, as a matter of claim interpretation, the Commission correctly held that the inclusion of the term ‘non-gimballed’ in claim 5 did not require that claims 1 and 12 be read to encompass a gimballed first transducer.” *Id.*

Similarly, in this case, the fact that other claims in the ‘480 Patent refer to adhesive layers does not require importing a “layer of non-adhesive material” into the claim term “a double sided adhesive layer.” “A claim construction is persuasive, not because it follows a certain rule, but because it defines terms in the context of the whole patent.” *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). In context, it is clear that the “double sided adhesive layer” was to be sticky on both sides, *i.e.*, double sided, and did not require the new element of a “layer of non-adhesive material.”

The district court erred in importing an additional element – a non-adhesive material – into the “double sided adhesive layer” of Claim 2. The plain language of the claim, “double sided adhesive layer,” is sufficient. Nothing more needs to be said other than the layer has two adhesive sides. Nothing in the ‘480 Patent supports the district court’s import of a “non-adhesive material” into the claim. To the contrary, every aspect of the ‘480 Patent is consistent with construction of the “double sided adhesive layer” as “a layer with adhesive on both sides,” as argued by ShieldMark. As explained below, the plain language of

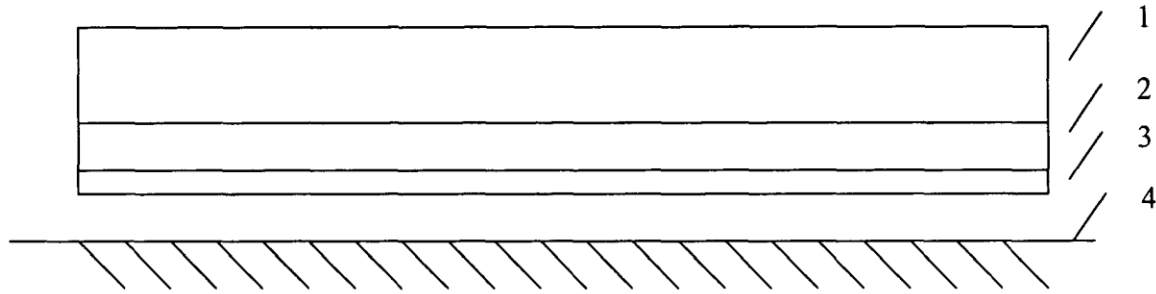
the ‘480 Patent demonstrates the error of the district court’s claim construction.

1) Among other elements, Claim 2 calls for two layers, a polymeric layer and an adhesive layer. Figure 1 and the “Detailed Description of the Invention” describe and depict two layers, including a single layer of adhesive. The ‘480 Patent states:

FIG. 1 is an example of the pressure-sensitive adhesive tape of this invention wherein a layer of polymeric material (1) is attached to the *top side* of a layer of pressure-sensitive adhesive material (2) and a laminating substrate (3) is attached to the *bottom side* of the pressure-sensitive adhesive material. Upon removal of the laminating substrate (3), the tape can be applied to a floor (4) with the application of pressure.

JA, pp. 21 – 25, Col. 1, lines 59-63 (emphasis added)). The language refers to a “top side” and “bottom side” of the adhesive material, making it clear that the adhesive layer is “double sided.”⁵

⁵ The laminating substrate referenced in the description is not an additional layer called for in Claim 2, but is in the nature of a release liner which is “usually peeled off and thrown away when pressure-sensitive adhesive tape is actually used.” JA, pp. 21 – 25, Col. 1, lines 52 – 56).



JA, p. 22, Figure 1). The adhesive layer is sticky on both sides, with one side sticking to the polymeric layer and one side sticking to the floor.

JA, p. 24, at Claim 2 (“where one side of the double sided adhesive layer is in substantially continuous contact with the first side of the polymer layer and an opposing side of the double sided adhesive layer is disposed to adhere to the flooring environment.”)).

2) The ‘480 Patent Abstract defines the tape as consisting of two layers, a polymer layer and a layer of adhesive.

The adhesive tape of this application comprises a layer of polymeric material, particularly a polyvinyl chloride, having a Shore A Hardness of between 92 and 100 and a layer of adhesive material attached to a surface of the layer of polymeric material.

JA, p. 21, Abstract. The abstract references a single layer of adhesive, not “non-adhesive material” with adhesive on both sides as construed by the court.

3) The '480 Patent Summary of Invention describes the tape as consisting of two layers.

The tape has a first layer of polymeric material having a Shore A Hardness of between 92 and 100 and a thickness of between 0.020" and 0.065", and a second layer of adhesive.

JA, p. 23, Col. 1, lines 35 – 37. There is no reference to a “non-adhesive material” with adhesive on both sides.

4) The specification states that “[t]he adhesive tape of this invention usually comprises a layer of polymeric material and at least *one layer of adhesive material.*” JA, p. 23, Col. 1, lines 47 – 49 (emphasis added)). There is no reference to “a layer of non-adhesive material” between the sides of the adhesive layer.

5) In the claim language, the adhesive tape is described as “comprising” “a polymer layer” and “a layer of pressure sensitive adhesive comprising a first side and an opposed second side.” JA, p. 23, Claim 1. There is no reference to “a layer of non-adhesive material” between the “sides” of the adhesive layer.

6) Claim 2 itself describes the adhesive tape as having “a polymer layer” and “a double sided adhesive layer where one side of the double sided adhesive layer is in substantially continuous contact with

the first side of the polymer layer and an opposing side of the double sided adhesive layer is disposed to adhere to the flooring environment.” *Id.*, Claim 2. There is no reference to “a layer of non-adhesive material” between the “sides” of the adhesive layer.

7) Claim 5 describes the adhesive tape as having “a polymer layer” and “a layer of adhesive attached to said polymer layer.” *Id.*, Claim 5. Again, there is no reference to a “layer of non-adhesive material” as part of the invention that causes the polymer layer to adhere to the floor surface.

Despite numerous examples in the specification of adhesives described with two sides, the district court found support for its construction in an example in the ‘480 Patent which referred to carpet tape. JA, p. 166. The reference to carpet tape in the specification, JA, p. 23, Col. 2, lines 39 – 43, was included for exemplary purposes only, as the specification itself stated, explaining that “the foregoing description, including the examples, shall be interpreted as illustrative and not in a limiting sense.” JA, p. 24, Col. 4, lines 12 – 17. This Court has “specifically rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being

limited to that embodiment.” *Philips*, 415 F.3d at 1323. Accordingly, to define the term “double sided adhesive layer” by reference to the sole example of carpet tape in the ‘480 Patent would improperly limit the claim to the single embodiment discussed.

As the plain language of the ‘480 Patent demonstrates, the claim term “double sided adhesive layer” means a layer that is sticky on both sides and no more. There was no basis to import a “layer of non-adhesive material” between the two sticky sides as an extraneous limitation on Claim 2 of the ‘480 Patent. Accordingly, the district court’s construction of Claim 2 should be reversed.

II. CLAIM 2 - THE DISTRICT COURT ERRED IN CONCLUDING THAT NO GENUINE ISSUES OF MATERIAL FACT EXISTED WITH REGARD TO WHETHER THE DEFENDANT’S PRODUCT LITERALLY INFRINGED ON THE CLAIM LIMITATION “DOUBLE SIDED ADHESIVE LAYER”.

Standard of Review

Orders granting or denying summary judgment are reviewed *de novo*, and should be affirmed only when “there is no genuine issue as to any material fact and . . . the moving party is entitled to a judgment as a matter of law.” *Crown Operations Int’l v. Solutia Inc.*, 289 F.3d 1367, 1375 (Fed. Cir. 2002).

Argument

A patent is infringed when a person “without authority makes, uses, offers to sell or sells any patented invention, within the United States . . . during the term of the patent.” 35 U.S.C. § 271(a). Literal infringement occurs where each element of at least one claim of the patent is found literally in the alleged infringer’s product. *Panduit Corp. v. Dennison Mfg. Co.*, 836 F.2d 1329, 1330 n. 1 (Fed. Cir. 1987). After claim construction, the trier of fact must then compare the properly construed claims with the accused infringing product. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995). This second step is a question of fact. *Bai v. L&L Wings, Inc.*, 160 F.3d 1350, 1353 (Fed. Cir. 1998). *See Brilliant Instruments, Inc. v. GuideTech, LLC*, 707 F.3d 1342, 1344 (Fed. Cir. 2013) (“Infringement, either literal or under the doctrine of equivalents, is a question of fact.”). “Thus, on appeal from a grant of summary judgment of noninfringement, we must determine whether, after resolving reasonable factual inferences in favor of the patentee, the district court

properly concluded that no reasonable jury could find infringement.”

*Id.*⁶

Pursuant to a proper construction of Claim 2 of the ‘480 Patent, the inquiry regarding literal infringement would not have required ShieldMark to prove that InSite’s product contained a “layer of non-adhesive material with adhesive on both sides.” In fact, it was undisputed that InSite’s product did not include “a layer of non-adhesive material with adhesive on both sides.” JA, p. 7. Accordingly, the court’s claim construction should be reversed along with the resulting decision that the InSite product do not literally infringe Claim 2.

III. CLAIM 2 - THE DISTRICT COURT ERRED IN DETERMINING THAT SHIELDMARK COULD NOT ESTABLISH INFRINGEMENT OF THE CONSTRUED “DOUBLE SIDED ADHESIVE LAYER” UNDER THE DOCTRINE OF EQUIVALENTS.

Even if a product does not literally infringe a patent claim, it may still infringe under the doctrine of equivalents if the differences between an individual element of the claimed invention and an element

⁶ InSite sought summary judgment as to Claims 2 and 5 of the ‘480 Patent and Claim 1 of the ‘292 Patent. These are independent claims. The remaining claims alleged to have been infringed are dependent claims.

of the accused product are insubstantial. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29 (1997). Infringement under the doctrine of equivalents is an intensely factual inquiry. *Vehicular Techs. Corp. v. Titan Wheel Int'l, Inc.*, 212 F.3d 1377, 1381 (Fed. Cir. 2000).

For a finding of infringement under the doctrine of equivalents, the claim element not literally present must be compared to the element of the infringing product. *Warner-Jenkinson Co.*, 520 U.S. at 40, 41. “The doctrine of equivalents covers accused structures that perform substantially the same function in substantially the same way with substantially the same results. The doctrine of equivalents thus covers structures with equivalent, but not identical, functions.” *Ring & Pinion Service, Inc. v. ARB Corp.*, Case No. 2013-1238, 2014 WL 627623, at *3 (Fed. Cir. 2014).

The determination of infringement can be based on the application of the tripartite “function-way-result” test. *Warner-Jenkinson Co.*, 520 U.S. at 40, 41. Under the “function-way-result” test, an element in an accused product is equivalent to the claimed element if the accused element performs substantially the same function, the same way, with

the same result. *Graver Tank & Mfg. v. Linde Air Prods. Co.*, 339 U.S. 605, 608 (1950).

The district court held that based on its construction of Claim 2 of the ‘480 Patent, it was impossible for ShieldMark to establish a case of literal infringement because “[t]he accused product in this case does not contain a layer of non-adhesive material with adhesive on both sides.” JA, p. 7. As discussed in Part I above, a properly construed Claim 2 does not require a layer of non-adhesive material as part of the “double sided adhesive layer.”

Faced with the district court’s erroneous claim construction, ShieldMark argued that InSite’s product infringed Claim 2 under the doctrine of equivalents. The district court erred by 1) holding that the application of the doctrine of equivalents was barred by the principle of claim vitiation; and 2) failing to apply the elements of the “function-way-result” test to determine whether there were genuine issues of fact precluding summary judgment.

A. The District Court Erred By Concluding That Claim Vitiating Is An Exception to the Doctrine of Equivalents.

Standard of Review

“Whether the doctrine of equivalents vitiated a patent claim is a question of law we review *de novo*.” *Cordis Corp. v. Boston Scientific Corp.*, 561 F.3d 1319, 1330 (Fed. Cir. 2009)

Argument

As demonstrated in Part B below, the “function-way-result” test establishes that InSite’s product’s adhesive layer performed the same function, in the same way, and with the same result as the “double sided adhesive layer” in the ‘480 Patent.

However, the district court held that ShieldMark’s argument for application of the doctrine of equivalents would “vitate a specific requirement in the claim at issue,” *i.e.*, the requirement that a “double sided adhesive layer” be comprised of a “layer of non-adhesive material with adhesive on both sides.” (Doc. 92 at 8). The court held that a reasonable jury could not find that InSite’s “use of a single layer of adhesive that does not sandwich a ‘layer of non-adhesive material’ is the equivalent of ‘a layer of non-adhesive material with adhesive on

both sides’ without completing eviscerating the ‘double-sided adhesive layer’ requirement in Claim 2.” JA, p. 8.⁷

The district court’s erroneous application of claim vitiation is demonstrated by this Court’s decision in *Deere & Company v. Bush Hog, Inc.*, 703 F.3d 1349 (Fed. Cir. 2012). In *Bush Hog*, this Court reversed under similar factual circumstances. This court reversed summary judgment of non-infringement entered by the district court because of an improper application of “vitiation” to a construed claim term. This Court held that the district court’s application of claim

⁷ The district court cited *Depuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005 (Fed. Cir. 2006), for the proposition that “if a theory of equivalence would entirely vitiate a particular claim element . . . judgment should be rendered by the court, as there would be no material issue for the jury to resolve.” *Id.* at 1017 quoting *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 39 n. 8 (1997) (emphasis in original). In *Depuy Spine, Inc.*, the district court granted summary judgment by finding a claim of infringement was not permitted pursuant to the doctrine of equivalents due to vitiation. This Court reversed, holding that this Court has not held “that the doctrine [of equivalents] is always foreclosed whenever a claim limitation does not literally read on an element of an accused device; such an interpretation of the ‘all elements’ rule would swallow the doctrine of equivalents entirely.” *Id.* at 1018. This Court found that the district court erred in granting summary judgment because “DePuy’s theory of equivalence is not legally insufficient” and a question of fact existed between whether the difference between limitation and the alleged equivalent is substantial. *Id.* at 1020.

vitiating evidenced a “common misperception” regarding vitiating. The

Court explained:

“Vitiating” is not an exception to the doctrine of equivalents, but instead a legal determination that “the evidence is such that no reasonable jury could determine two elements to be equivalent.” . . . The proper inquiry for the court is to apply the doctrine of equivalents, asking whether an asserted equivalent represents an ‘insubstantial difference’ from the claimed element, or “whether the substitute element matches the function, way and result of the claimed element.”

Id. at 1356 (citations omitted).

Courts should be cautious not to shortcut this inquiry by identifying a “binary” choice in which an element is either present or “not present.” Stated otherwise, the vitiating test cannot be satisfied by simply noting that an element is missing from the claimed structure or process because the doctrine of equivalents, by definition, recognizes that an element is missing that must be supplied by the equivalent substitute. If mere observation of a missing element could satisfy the vitiating requirement, this “exception” would swallow the rule..

Id. at 1356-1357 (citation omitted).

In *Bush Hog*, the district court construed the term “contact” to require “direct contact,” and thus refused to recognize as an equivalent a device that involved “no direct contact.” The Court found that this was error because the jury should have been permitted to determine whether “a small spacer connecting the upper and lower deck walls

represents an *insubstantial difference* from direct contact.” *Id.* at 1357 (emphasis in original). Accordingly, the Court vacated the district court’s determination that the plaintiff was barred from asserting infringement under the doctrine of equivalents.

Similarly, in this case, the jury should have been permitted to determine whether InSite’s product, which admittedly contains an adhesive layer, is the legal equivalent of the “double sided adhesive layer” in Claim 2. “The test for equivalence of a proposed substitute for a missing element is ordinarily a factual inquiry reserved for the finder of fact.” *Id.* at 1356. A reasonable jury could decide that the two were equivalents, and that a tape will stick to both the floor and the polymer layer, irrespective of whether the tape contains a layer of adhesive sticky on both sides, or whether the tape includes a “non-adhesive material” with adhesives on both sides. It is for the jury to decide whether a “non-adhesive material” sandwiched between layers of adhesive is an insubstantial difference from the claimed “double sided adhesive layer.”

Accordingly, the judgment of the district court should be reversed.

B. The District Court Erred In Failing to Apply the Doctrine of Equivalents and the “Function-Way-Result” Test to Determine Whether a Genuine Issue of Fact Existed Regarding Whether InSite’s Product Infringed on Claim 2 of the ‘480 Patent.

Standard of Review

Orders granting or denying summary judgment are reviewed *de novo*, and should be affirmed only when “there is no genuine issue as to any material fact and . . . the moving party is entitled to a judgment as a matter of law.” *Crown Operations Int’l v. Solutia Inc.*, 289 F.3d 1367, 1375 (Fed. Cir. 2002). *See Hologic, Inc. v. SenoRx, Inc.*, 639 F.3d 1329, 1334 (Fed. Cir. 2011). This Court “reviews a district court’s grant of summary judgment without deference.” *Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1353 (Fed. Cir. 2012). “At the summary judgment stage, we credit all of the nonmovant’s evidence and draw all justifiable inferences in its favor.” *Brilliant Instruments, Inc. v. GuideTech, LLC*, 707 F.3d 1342, 1344 (Fed. Cir. 2013).

Argument

“The test of the equivalence of a proposed substitute for a missing element is ordinarily a factual inquiry reserved for the finder of fact.” *Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1356 (Fed. Cir. 2012). In

evaluating whether the doctrine of equivalents requires a finding of infringement, “[t]he question is ‘whether an omitted part is supplied by an equivalent device or instrumentality.’” *Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1356 (Fed. Cir. 2012).

“The proper inquiry for the court is to apply the doctrine of equivalents, asking whether an asserted equivalent represents an ‘insubstantial difference’ from the claimed element, or ‘whether the substitute element matches the function, way, and result of the claimed element.’” *Id.* at 1356 (citation omitted). If a reasonable jury could find equivalence, then the court must deny summary judgment. *Id.* at 1356.

Under the “function-way-result” test, an element in an accused product element is equivalent to the claimed element if the accused element performs substantially the same function in substantially the same way to achieve substantially the same result. *Graver Tank & Mfg. v. Linde Air Prods. Co.*, 339 U.S. 605, 608 (1950).

ShieldMark has at least established an issue of fact regarding whether InSite’s product contained an equivalent of the construed “double sided adhesive layer” element in Claim 2. Dr. Jerry M. Serra, Ph.D, an expert with more than 40 years of experience in the area of

pressure sensitive tape, including several patents in the area, concluded that InSite’s adhesive tapes:

include an adhesive layer which performs substantially the same function in substantially the same way to obtain substantially the same result as a layer of non-adhesive material with adhesive on both sides, where one side of the adhesive layer is in largely but not necessarily wholly, uninterrupted contact with the first side of the polymer layer and an opposing side of the adhesive layer is disposed to adhere to the flooring environment.

JA, p. 373, section (B)(1)(c).⁸ As more completely detailed below, all elements of the “function-way-result” test are met.

First, the adhesive layer in InSite’s product performs substantially the same function as the equivalent structure in the ‘480 Patent. “The adhesive layer at issue is the method by which the tape adheres to a flooring environment. The function performed by this adhesive layer is the fastening or securing of the tape to the floor.” JA, p. 373 (Dr. Serra). See also, Defendant’s declaration stating “... the adhesive for securing the accused products to the floor...” JA, p. 193 at ¶11 (Lowe)). Because the purpose of the structure is to secure the tape to the floor, the “single layer of adhesive with no interposed non-

⁸ At his deposition, Dr. Serra authenticated his expert report, and indicated that he would testify in accordance with and consistent with the report. JA, p. 262.

adhesive material,” such as contained in the InSite product, serves an equivalent function to a “layer of non-adhesive material with adhesive on both sides,” as the district court construed the “double sided adhesive layer” to require. See, defendant Lowe declaration describing use of both types of adhesive for same function, JA, p. 192 at ¶6. Accordingly, the “function” prong of the “function-way-result” test is met.

Second, the “way” or “means” by which the function is performed is the same in the InSite product as in the ‘480 Patent. “Both the ‘480 Patent and the Superior Mark product employ an ‘adhesive layer attached to the polymer layer’ to secure the tape to the floor.” JA, p, 374, ¶ 2. Giving weight to ShieldMark’s expert Dr. Serra, a reasonable jury could find that the “way” in which InSite’s product secures the tape to the floor with a “single layer of adhesive with no interposed non-adhesive material” is substantially equivalent to the ‘480 Patent’s method of securing the tape to the floor with “a layer of non-adhesive material with adhesive on both sides.” JA, p, 374, ¶ 2. See also defendant Lowe declaration at JA, p. 192 at ¶6.

The district court failed to follow this Court’s decision in *Bush Hog*, and determine whether genuine issues of fact existed regarding

whether InSite’s adhesive layer performed in the same “way” as the “double sided adhesive layer” in Claim 2 the ’480 Patent. Instead, the district court, recalling its prior findings regarding claim construction, doubled down on its claim vitiation holding, and held that the “way” prong could not be met because Claim 2 differentiated “double-sided adhesive’ from ‘a layer of adhesive.” JA, p. 9. The district court wrote that “[w]hile it may be argued that any adhesive may serve the same function and produce the same result (i.e., to adhere) as the ‘double-sided adhesive’ called for in the Patent, the ‘way’ in which double-sided adhesive works compared to other layers of adhesive was deemed significant and important enough to the inventor/applicant to require differentiation within the patent language.” *Id.* This misses the mark. The district court appears to hold that because the ’480 Patent differentiated between a mere layer of adhesive on the one hand, and a “double sided adhesive layer” on the other, that the “way” prong of the equivalents analysis – as a matter of law – could not be found vis-à-vis the accused products.

Alternatively, the district court commented in a footnote that:

there is no evidence to suggest that a single layer adhesive would have worked in the same “way” as a double-sided

adhesive in Plaintiff's product because prior to the addition of the "edge feature" or "channel" off-set by the steps in the accused product, there would have been no means of containing the adhesive strictly to the underside of the product without the potential for some degree of spread.

JA, p. 9, fn. 3. As a first principle, the equivalents analysis should be on the respective adhesive elements but the distinction attempted by the district court's footnote is focused on a completely different element, namely, the polymer layer edge features. Nonetheless, Dr. Serra specifically testified in his deposition on the potential for adhesive spread or "ooze" in the accused products:

My understanding is that the step prevents the adhesive from oozing out underneath that edge. And while I would disagree with that, because this is a viscoelastic material and if you have a forklift or if you have a heavy weight that runs over the edge and doesn't cover that step when it hits it, just on the inside of that step, the weight from that adhesive, the weight from the forklift or whatever going over it would, with time is going to force that adhesive out from underneath that step, it's going to ooze, it has to because it's a viscoelastic material and with time that's going to happen. So while it may retard it or slow it, with time it's going to ooze because it's pressure sensitive.

JA, pp. 333 – 334. Dr. Serra thus considered and rejected the idea that the edge features prevent ooze. At end, whether the InSite adhesive was a substantial equivalent to the adhesive in Claim 2 is an issue for the

jury, not for the district court to decide as a matter of fact on a summary judgment motion.⁹

Third, the result achieved by InSite's product is substantially equivalent to the result achieved by the "double sided adhesive layer" of the '480 Patent. "The methods of the '480 Patent and the Superior Mark product each result in a measure of strength of an adhesive bond between the adhesive tape and a test surface greater than 2 lbs for each inch width, when the angle between the test surface and the direction of the force which is pulling the tape from the test surface is 90 degrees, waiting one hour from sample preparation to conduct the test method." JA, p. 374, ¶3; JA, 70, Saqqa Declaration at ¶13). Accordingly, the result element of the "function-way-result" test is met.

The evidence and expert opinion presented to the district court established that the adhesive layer of the InSite product performed with the same "function-way-result" as the "double sided adhesive

⁹ The district court's decision also wandered far afield from the claim limitation before it, *i.e.*, the "double sided adhesive layer." The "edge feature" and "channel" referenced by the district court were not part of the claim limitation before it, and, therefore, could not provide any basis for finding that the adhesive layer of the accused products perform in a different "way" than the "double sided adhesive layer" of Claim 2 of the '480 Patent.

layer” of Claim 2, meeting the test under the doctrine of equivalents.

Accordingly, the judgment of the district court should be reversed.

IV. ‘480 PATENT CLAIM 5, ‘292 PATENT CLAIM 1 - THE DISTRICT COURT ERRED IN CONCLUDING THAT NO GENUINE ISSUES OF MATERIAL FACT EXISTED WITH REGARD TO WHETHER THE DEFENDANT’S PRODUCT WAS OF A “SUBSTANTIALLY UNIFORM THICKNESS”.

Standard of Review

Orders granting or denying summary judgment are reviewed *de novo*, and should be affirmed only when “there is no genuine issue as to any material fact and . . . the moving party is entitled to a judgment as a matter of law.” *Crown Operations Int’l v. Solutia Inc.*, 289 F.3d 1367, 1375 (Fed. Cir. 2002). *See Hologic, Inc. v. SenoRx, Inc.*, 639 F.3d 1329, 1334 (Fed. Cir. 2011). This Court “reviews a district court’s grant of summary judgment without deference.” *Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1353 (Fed. Cir. 2012). “At the summary judgment stage, we credit all of the non-movant’s evidence and draw all justifiable inferences in its favor.” *Brilliant Instruments, Inc. v. GuideTech, LLC*, 707 F.3d 1342, 1344 (Fed. Cir. 2013).

Argument

Claim 5 of the ‘480 Patent provided in pertinent part for “[a]n adhesive tape comprising: a polymer layer having a Shore A Hardness of between 92 and 100 and a substantially uniform thickness of between about 0.020” to 0.065”.” JA, p. 24, claim 5. A similar term, “substantially uniform thickness of between 20 mil and 65 mil” is present in Claim 1 of the ‘292 Patent. JA, p. 31, claim 1. The district court construed the polymer layer “substantially uniform thickness” to mean “a largely, but not necessarily wholly, uniform distance between the upper surface and the lower surface without significant deviations, protrusions, or steps.” JA, p. 169. The district court granted summary judgment in favor of InSite on the factual issue of whether InSite’s polymer layer literally met the construed claim limitation “substantially uniform thickness” that is, “without significant deviations, protrusions, or steps.”

The factual dispute regarding whether the products were of “substantially uniform thickness” centered on the fact that the extreme edges of InSite’s product were tapered and included a foot that created a

recess or channel on the lower side of the polymer layer.¹⁰ The factual dispute was whether the existence of the edge feature caused InSite's polymer layer to have "significant deviations, protrusions, or steps." Evidence was presented by both parties on this issue.

ShieldMark presented the testimony of its expert Jerry M. Serra, Ph.D, an expert with more than 40 years of experience in the area of pressure sensitive tape, including several patents in the area. JA, pp. 376 – 378. Dr. Serra testified that InSite's "Superior Mark" branded tapes literally infringed on Claim 5 of the '480 Patent. JA, pp. 369 – 372. Dr. Serra testified based on data from two laboratories which tested the InSite product: the Akron Rubber Development Laboratory (ARDL Report) commissioned by InSite and Chemsultants, Inc. commissioned by ShieldMark. JA, p. 371.

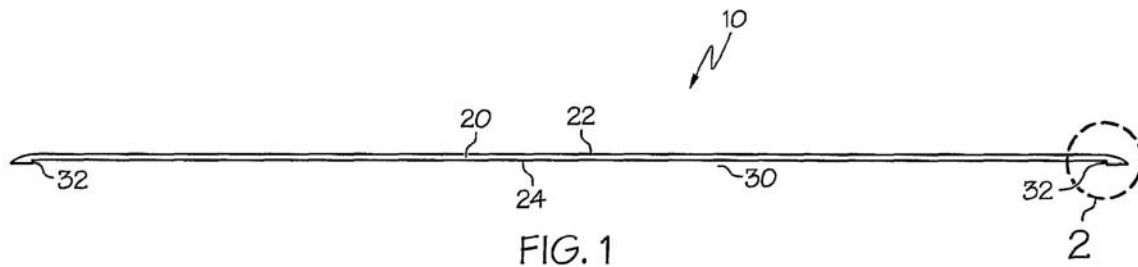
Claim 5 requires a "substantially uniform thickness of between about 0.020" to 0.065"." JA, p. 24, claim 5. The ARDL Report noted that the InSite polymer layer had a thickness of 0.0298", well within the 0.020" to 0.065" range cited in Claim 5. JA, p. 370. This is consistent

¹⁰ InSite's witness said this feature inhibited adhesive from oozing out from under the tape (JA, p. 139, ¶ 11), but ShieldMark's expert disagreed (JA, pp. 333 – 334).

with the declaration of InSite manager Lowe that for the vast majority its surface, the thickness of the InSite polymer layer is 0.027". JA, p. 192, ¶ 9; pp. 194 – 196.

Based on this data, Dr. Serra concluded that the accused Superior Mark polymer layer “include a largely, but not necessarily wholly, uniform distance between the upper surface and the lower surface without significant deviations, protrusions, or steps, between 0.020" and 0.065".” JA, p. 370. Dr. Serra followed the district court’s construction of the applicable claim terms, acknowledging that “[t]he language ‘largely, but not necessarily wholly’ means some variation is permitted. *Id.* The limits of the variation permitted according to the claim construction are that the thickness must be without ‘significant deviations, protrusions, or steps.’” *Id.* Dr. Serra concluded that “the Superior Mark product literally includes a ‘largely, but not necessarily wholly’ uniform thickness ‘without significant deviations, protrusions, or steps.’” *Id.*

Dr. Serra explained his analysis through the following drawing of the accused, InSite product. The taper and step of the product are circled and indicated by the number “2.”



Dr. Serra evaluated the effect of the steps on the overall thickness of the InSite polymer layer in several ways which demonstrated that the InSite polymer layer had a “substantially uniform thickness.” First, Dr. Serra calculated that almost all of InSite’s product fell within the range of thickness specified in the ‘480 Patent, concluding “that more than 95 % of the Superior Mark product includes a polymer layer with a thickness in the claimed range (i.e. the accused product thickness of 0.027” is within the claim range of 0.020” and 0.065”).” *Id.* Accordingly, more than 95% of InSite’s polymer layer meets the thickness limitation of Claim 5.

Second, Dr. Serra calculated that the steps featured in the InSite product “account for less than 1% of the overall area of the polymer

layer: roughly 0.57% for a four-inch wide tape.” JA, p. 371. For InSite’s two-inch product, Dr. Serra calculated that the step features account for roughly 1.16% of the area of the polymer layer. *Id.* The converse is that the thickness of the accused product polymer layer is exactly the same over 99.43% of a four-inch tape and 98.84% of the area of a two-inch tape.

Third, Dr. Serra calculated the amount of weight that the steps contribute to the InSite product, calculating that the step features “account for less than 1% of the overall weight of the polymer: roughly 0.039% for a four-inch wide tape.” *Id.* These calculations were attached to Dr. Serra’s report as Exhibit 3. JA, pp. 380 – 383.

Accordingly, Dr. Serra concluded that “[a] variation of a single percentage point or less for area and weight is not a ‘significant deviation, protrusion or step’ in my opinion.” JA, p. 371.

Dr. Serra explained why his analysis included area and weight to assess significance of thickness under questioning in his deposition from the vantage of someone skilled in the art:

- Q. The patent doesn’t tell you to concern yourself with cross-sectional area, does it?
- A. Correct.

- Q. The patent doesn't tell you to concern yourself with weight or mass of the polymer layer, does it?
- A. Correct.
- Q. But yet that's what you chose to measure?
- A. Yes.
- Q. Was that, did you come up with that or was that, was that suggestion planted in your mind?
- A. No, that's from my forty years of experience in the adhesive industry, because measuring thickness can be very difficult at times, so whenever there's a dispute about thickness, then we go to weight because weight, there's no question about weight. That's why I went to weight, that's why I went down the road I went on, basically because my experience in the adhesive industry, we've seen it time and time again, when a person makes a product they will say I want X mils of thickness, nine times out of ten they will say it will have a certain weight.

JA, pp. 290 – 291.

Rather than allow the jury to decide if the variation in the thickness caused by the steps was “significant,” the district court became the factfinder and decided that as a matter of fact the steps were “significant.” The district court erred in at least two respects.

First, the district court erred in applying the term “significant” to the function of the InSite product, dwelling on the defendant's assertion that the steps created a channel to which adhesive was applied and

prevented skids from catching on the edge of the tape. JA, pp. 10 – 13.¹¹

The district court concluded that “significance in either size or functionality would be sufficient to meet the exclusion criteria of the claim language” JA, p. 15, fn. 8. However, nothing in the claim element of a polymer layer having a “substantially uniform thickness,” either on its face or as construed by the district court, implicates any functional “significance” of the polymer layer. The district court’s analysis of this claim term went well beyond the thickness of the polymer layer, venturing into purported functions of the foot and taper and the purpose of the recess, none of which were addressed in the claim term. The district court concluded:

In so far as the recess created by the steps on the accused product also functioned to keep the tape flat against the floor without any raised edge created by adhesive, it also serves the same function of improving the tape’s ability [sic] lay flat against the floor and to withstand traffic from skids and pallets. These statements all provide evidence that the function imported by the steps and tapering on the accused product is significant in so far as it allows the tape to lie flat

¹¹ See JA, p. 10 (“these steps have a function”); *id.* (“this tapered edge serves the purpose”); JA, p. 11 (“the tapered edge on the accused product served an important function”); JA, p. 12 (“tapered edges were advertised as a benefit”); *id.* (“Lowe submitted a Declaration attesting to the functional significance of both the steps and the tapering”); *id.* (“he further described the function of the steps”).

with the floor and eliminates the potential for skids and pallets to catch on the edge of the tape.

JA, p. 13. None of this evidence is relevant to whether the steps were “significant” relative to the “substantially uniform thickness” of the polymer layer which was the claim limitation in issue.

That the district court viewed functional significance as dispositive is evident from its criticism of Dr. Serra because “he did not address functional significance in his report.” JA, p. 14. Plainly, Dr. Serra did not address the functional significance of the steps because function was irrelevant and the claim limitation he was addressing was “substantially uniform thickness” and whether there were any “significant deviations, protrusions or steps.” Accordingly, the district court’s analysis of the purported significance of the edge feature to the function of InSite’s polymer layer should be disregarded as wholly irrelevant to the issue of whether InSite literally infringed with respect to the element of “substantially uniform thickness.”¹²

¹² InSite’s product infringes the ‘480 Patent even though the ‘480 Patent does not include a step because of the open-ended nature of Claim 5 which describes an “adhesive tape comprising” JA, p. 24. Specifically, the open-ended claim transition phrase “comprising” allows a finding of infringement when an accused product includes elements beyond those called for in a claim. *Genentech, Inc. v. Chiron Corp.*, 112

Second, the district court erred in taking the issue of whether the steps were “significant” away from the jury and deciding this fact on its own. On a motion for summary judgment, the function of the district court is to determine if genuine issues of fact exist, not to determine disputed issues of fact. There is no dispute that decisions regarding whether matters are “significant” are traditionally factual issues for the jury. This Court has frequently had before it cases in which the jury was instructed in various contexts to evaluate whether matters were “significant.”¹³

F.3d 495, 501 (Fed. Cir. 1997) (“‘Comprising’ is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.”).

¹³ See *K&K Jump Start/Chargers, Inc. v. Schumacher Elec. Corp.*, 52 F. App’x 135, 139 (Fed. Cir. 2002) (“It emphasized that the jury was permitted to consider all the circumstances, stating that ‘[r]easonable diligence exists when there is a continuous course of activity, carried on without *significant* interruption and accomplished in a *reasonably* prompt manner, considered in light of *all the attendant circumstances*’ (emphases added)”; *Monroe Eng’g Products, Inc. v. Winco, Inc.*, 121 F.3d 728 (Fed. Cir. 1997) (“It was certainly reasonable for the jury to conclude that ‘no *significant* portion of the outer periphery [was] lacking or treated differently’ in the arrangement of the anchoring projections” (emphasis added)); *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1567 (Fed. Cir. 1992) (jury instructed that “[t]he end product of the reverse-engineering process may be an original mask work, and therefore not an infringing mask work, if the resulting

Claim 5 of the '480 Patent calls for a polymer layer having a “substantially uniform thickness” which was to be between 0.020” and 0.065”. Dr. Serra opined that, based on testing and analysis, the InSite product was without “significant deviations, protrusions or steps,” because the tapered edge was less than 1 % of weight and area of the InSite product. JA, pp. 370 – 371. Dr. Serra also opined that 95 % of

semiconductor chip product is not substantially identical to the protected mask work and its design involved *significant* toil and investment so that it is not mere plagiarism.” (Emphasis added.); *Jamesbury Corp. v. Litton Indus. Products, Inc.*, 756 F.2d 1556, 1557 (Fed. Cir. 1985) *overruled on other grounds*, *A.C. Aukerman Co. v. R.L. Chaides Constr. Co.*, 960 F.2d 1020, 22 USPQ2d 1321 (Fed. Cir. 1992) (*en banc*) (“the jury returned a verdict for Litton, concluding, in answer to an interrogatory, that the asserted claims did not differ in any ‘*significant* particulars’ from the prior art” (emphasis added)).

See also Federal Circuit Bar Association, Model Patent Jury Instructions, February 2013, Instruction B.4.3. (“To be an inventor, one must make a *significant* contribution to the conception of at least one or more of the claims of the patent [even if that claim has not been alleged to be infringed].” (Emphasis added.)) at <http://www.fedcirbar.org>; National Patent Jury Instructions (<http://www.nationaljuryinstructions.org>) 3.5 (“Consisting essentially of” means that the claimed invention may include requirements that are not expressly listed in the claim, provided those additional requirements do not *significantly* affect the basic and novel properties of the invention.” (Emphasis added.)); 3.12 (“the component must be a *significant* part of the invention” (emphasis added)); 5.8 (“To be an inventor, one must make a significant contribution to the conception of one or more of the claims of the patent. Whether the contribution is *significant* is measured against the scope of the full invention.” (Emphasis added.)).

InSite's polymer layer had a thickness that fell "literally" within the range specified in the claim limitation. JA, pp. 370, ¶3. *The district court never mentioned this opinion rendered by Dr. Serra.* The steps which did not fall within the range set forth in Claim 5 constituted less than 5 % of the InSite product. This fact, together with Dr. Serra's findings that the steps and tapered edge were 1 % or less of the weight and area of the InSite product, created a factual issue for the jury. The district court ignored this evidence and misstated that ShieldMark had provided no evidence whatsoever regarding the thickness of the InSite product vis-à-vis the steps. JA, p. 15 ("[p]laintiff has presented no evidence....").

The only fact presented by InSite relevant to whether the steps constituted a "significant" deviation, protrusion or step, was the assertion of InSite Managing Director Lowe that the depth of the steps was 18.5% of the overall thickness of the polymer layer. JA, p. 12.¹⁴ What the witness was actually describing is a small bump or pimple of extra thickness. The district court stated that "the steps have a depth

¹⁴ Lowe cited three reasons why the "non-uniform nature of the polymer layer is significant," all of which related to its functionality, and not its thickness. JA, p. 12.

that equals 18.5% of the overall thickness of the polymer layer, which can be considered a significant size step relative to the overall thickness.” JA, p. 13. The district court discounted Dr. Serra’s opinions and analysis on the ground that “Dr. Serra’s report does not address the significance of the steps and tapering of the accused product relative to the overall thickness of the product.” JA, p. 14). As explained above, this is wholly incorrect. See, JA, p. 370, ¶ 4 (95 % of InSite polymer layer was of “substantially uniform thickness”).¹⁵

The district court’s evaluation of the record violated the summary judgment standard. “The evidence of the nonmovant is to be believed, and all justifiable inferences are to be drawn in his favor.” *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986). The district court violated both prongs of this standard. The district court either disbelieved or ignored Dr. Serra’s finding that “more than 95% of the Superior Mark

¹⁵ There was evidence that the steps constituted even less than the 18.5 % claimed in Lowe’s declaration. Lowe stated that the steps were 0.005” deep which was 18.5% of the polymer layer of 0.027”. JA, p. 193. However, Cheryl Saqqa of Chemsultants, who tested ten (10) samples of InSite’s product found that the samples ranged in the thickness of the polymer layer from 0.026” to 0.032”, for an average of 0.030”. JA, 72. A step of 0.005” is 16.6 % of a 0.030” polymer layer. In addition, InSite’s marketing materials referred to the polymer layer having a thickness of 0.032”. JA, p. 370. A step of 0.005” is 15.6 % of a polymer layer of 0.032”. Resolution of these factual issues was for the jury.

product includes a polymer layer with a *thickness* literally in the claimed range” JA, p. 370, ¶ 4 (emphasis added). This contravenes the district court’s claim that ShieldMark offered no evidence “relative to the thickness of the product.” JA, p. 15.

Likewise, the district court was required to draw all inferences in ShieldMark’s favor and not grant summary judgment where there were issues of fact. The “conflict in expert declarations . . . created a genuine issue of material fact that made summary judgment inappropriate.” *B-K Lighting, Inc. v. Fresno Valves & Castings, Inc.*, 375 Fed. App’x 28, 32 (Fed. Cir. 2010) (citations omitted).

That the depth of the step was less than one-fifth of the thickness of InSite’s product (18.5%) does not permit the district court to determine, as a matter of law, that the steps were a “significant” deviation, protrusion, or step, particularly when there are facts of record establishing that 95 % of the infringing product is of uniform thickness within the range specified in Claim 5 of the ‘480 Patent and Claim 1 of the ‘292 Patent. Resolution of such questions is for the jury.

Accordingly, the district court erred in granting InSite summary judgment on the issue of literal infringement with respect to Claim 5 of

the '480 Patent and Claim 1 of the '292 Patent, and the judgment of the district court should be reversed.

CONCLUSION AND STATEMENT OF RELIEF SOUGHT

For the reasons set forth more fully hereinabove, the judgment of the district court should be reversed, and the cases remanded for further proceedings.

Respectfully submitted,

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CERTIFICATE OF FILING AND SERVICE

I hereby certify that on this 24th day of March, 2014, I caused this Brief of Appellant to be filed electronically with the Clerk of the Court using the CM/ECF System, which will send notice of such filing to the following registered CM/ECF users:

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Dated: March 24, 2014

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ADDENDUM

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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
EASTERN DIVISION

SHIELDMARK, INC.,)	
)	CASE NO.: 1:12 CV 223
Plaintiff,)	1:13 CV 572
)	
v.)	JUDGE DONALD C. NUGENT
)	
INSITE SOLUTIONS, LLC.)	
)	<u>MEMORANDUM OPINION</u>
Defendant.)	<u>AND ORDER</u>
)	

This matter is before the Court on Defendant's Motions For Summary Judgment of Non-Infringement in case number 1:12 CV 223, (ECF #58), and in case number 1:13 CV 572, (ECF #16). Plaintiff filed Memoranda in Opposition in both cases, (ECF # 72 and ECF #20, respectively), and Defendant filed Replies in support of its motions, (ECF #76 and ECF #21, respectively). The Court heard oral arguments on the motions on October 22, 2013. (ECF #91 in Case Number 12 CV 223). After careful consideration of the briefs and a review of all relevant evidence and authority, Defendant's motions for Summary Judgment are, hereby, GRANTED.

The parties agree that the '292 Patent is a continuation of the patent application that issued as the '480 Patent, and they do not dispute that these two patents share the same inventor, same assignee, same specification, and same drawing. They also agree that the same claim construction applied to the '480 Patent should apply to the '292 Patent. Finally, they appear to agree that infringement under all the asserted claims in this case is dependent on whether two claim elements are present in the allegedly infringing product, those being:

The facts and procedural history have been taken from the undisputed statements set forth in the parties' briefs, and official court records. In accordance with the applicable standards on a motion for summary judgment, genuine questions of material fact have been resolved in favor of the non-moving party, in this case, the Plaintiff.

(1) whether the allegedly infringing product includes a “double sided adhesive layer,” as required under claim 2 of the ‘480 Patent, and

(2) whether the allegedly infringing product has a “substantially uniform thickness,” as required under claim 5 of the ‘480 Patent and claims 1-3 of the ‘292 Patent.

STANDARD OF REVIEW

Summary judgment is appropriate when the court is satisfied “that there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law.” FED. R. CIV. P. 56(c). The burden of showing the absence of any such “genuine issue” rests with the moving party:

[A] party seeking summary judgment always bears the initial responsibility of informing the district court of the basis for its motion, and identifying those portions of ‘the pleadings, depositions, answers to interrogatories, and admissions on file, together with affidavits, if any,’ which it believes demonstrates the absence of a genuine issue of material fact.

Celotex Corp. v. Catrett, 477 U.S. 317, 323 (1986) (citing FED. R. CIV. P. 56(c)). A fact is “material” only if its resolution will affect the outcome of the lawsuit. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). Determination of whether a factual issue is “genuine” requires consideration of the applicable evidentiary standards. The court will view the summary judgment motion in the light most favorable to the party opposing the motion. *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 587 (1986).

Summary judgment should be granted if a party who bears the burden of proof at trial does not establish an essential element of their case. *Tolton v. American Biodyne, Inc.*, 48 F.3d 937, 941 (6th Cir. 1995) (citing *Celotex*, 477 U.S. at 322). Accordingly, “[t]he mere existence of

a scintilla of evidence in support of the plaintiff's position will be insufficient; there must be evidence on which the jury could reasonably find for the plaintiff." *Copeland v. Machulis*, 57 F.3d 476, 479 (6th Cir. 1995) (citing *Anderson*, 477 U.S. at 252). Moreover, if the evidence presented is "merely colorable" and not "significantly probative," the court may decide the legal issue and grant summary judgment. *Anderson*, 477 U.S. at 249-50 (citations omitted). In most civil cases involving summary judgment, the court must decide "whether reasonable jurors could find by a preponderance of the evidence that the [non-moving party] is entitled to a verdict." *Id.* at 252. However, if the non-moving party faces a heightened burden of proof, such as clear and convincing evidence, it must show that it can produce evidence which, if believed, will meet the higher standard. *Street v. J.C. Bradford & Co.*, 886 F.2d 1472, 1479 (6th Cir. 1989).

Once the moving party has satisfied its burden of proof, the burden then shifts to the non-mover. The non-moving party may not simply rely on its pleadings, but must “produce evidence that results in a conflict of material fact to be solved by a jury.” *Cox v. Kentucky Dep’t of Transp.*, 53 F.3d 146, 149 (6th Cir. 1995). FED. R. CIV. P. 56(e) states:

When a motion for summary judgment is made and supported as provided in this rule, an adverse party may not rest upon the mere allegations or denials of the adverse party's pleading, but the adverse party's response, by affidavits or as otherwise provided in this rule, must set forth specific facts showing that there is a genuine issue for trial.

The Federal Rules identify the penalty for the lack of such a response by the nonmoving party as an automatic grant of summary judgment, where otherwise appropriate. *Id.*

Though parties must produce evidence in support of and in opposition to a motion for summary judgment, not all types of evidence are permissible. The Sixth Circuit has concurred with the Ninth Circuit’s position that ““only admissible evidence may be considered by the trial

insubstantial. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29 (1997). The substantiality of the difference(s) is determined by using a three-part “function-way-result test.” *Id.* at 40-41. Under this test, an accused product element is equivalent to a claimed element if it performs substantially the same function in substantially the same way to accomplish the same result. *Graver Tank & Mfg. v. Linde air Prods. Co.*, 339 U.S. 605, 608 (1950). The doctrine of equivalents does not apply, however, when an amendment, made for a reason substantially related to patentability, narrows the patent’s scope enough to exclude the difference(s) at issue. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 740 (2002).

I. Double Sided Adhesive Layer

Claim 2 of the ‘480 Patent includes the requirement that the patented product contain a “double sided adhesive layer.” Based on the patent language, the arguments presented during the claim construction briefing and oral argument, and application of the doctrine of claim differentiation, this Court found that “double sided adhesive layer” must be defined as “a layer of non-adhesive material with adhesive on both sides.” (ECF #54, in Case Number 12 CV 223). The accused product in this case does not contain a layer of non-adhesive material with adhesive on both sides. Neither party disputes that there is no literal infringement of Claim 2 based on the Court’s claim construction of this term.² Nonetheless, Plaintiff claims that the product infringes Claim 2 of the ‘480 Patent under the doctrine of equivalents.

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Plaintiff's expert, Dr. Serra, admitted in his deposition that he concluded that the accused products "do not have a layer of non-adhesive material with adhesive on both sides." (ECF #19-1: Serra Depo. at 56, in Case Number 13 CV 572).

To find for Plaintiff on this issue, the Court would have to find that the claim term “double-sided adhesive” is substantially indistinguishable in function, way, and result, from a “layer of adhesive,” which is present in the accused product. As set forth in the Court’s claim construction opinion, however, claim differentiation requires the Court to recognize consequential differences in claims when the inventor uses different words in separate claims. *CAE Screenplates, Inc. v. Heinrich Fiedlern GmbH & Co. KG*, 224 F.3d 1308, 1317 (Fed. Cir. 2000); *Tandon Corp. v. United States Int’l Trade Comm’n*, 831 F.2d 1017, 1023 (Fed. Cir. 1987). Because the ‘480 Patent distinguished the “double sided adhesive layer” in Claim 2 from the layers of “adhesive material” described in Claims One and Five, recognizing an adhesive layer that does not fit the definition of “double sided adhesive layer” as an equivalent would render the language in Claim 2 superfluous and would violate the principle of claim differentiation. *Id.*

Plaintiff’s position would apply the doctrine of equivalents in such a way as to vitiate a specific requirement in the claim at issue. “[I]f a theory of equivalence would entirely vitiate a particular claim element ... judgment should be rendered by the court, as there would be no further *material* issue for the jury to resolve.” (emphasis in the original). *Depuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1017 (Fed. Cir. 2006), citing *Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 39 n.8, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997). Neither this Court, nor any reasonable jury, can find that the Defendant’s use of a single layer of adhesive that does not sandwich a “layer of non-adhesive material” is the equivalent of “a layer of non-adhesive material with adhesive on both sides” without completely eviscerating the “double-sided adhesive layer” requirement in Claim 2.

Further, the ‘480 Patent, by differentiating “double-sided adhesive” from “a layer of

adhesive” prevented a finding that the “way” portion of the “function-way-result” test could be met. While it may be argued that any adhesive may serve the same function and produce the same result (i.e., to adhere) as the “double-sided adhesive” called for in the Patent, the “way” in which double-sided adhesive works compared to other layers of adhesive was deemed significant and important enough to the inventor/applicant to require differentiation within the patent language.³ Therefore, the “way” portion of the “function-way-result” test is not satisfied, and the doctrine of equivalents does not apply. Defendant is entitled to summary judgment on the issue of infringement relative to Claim 2 in the ‘480 Patent.

II. Substantially Uniform Thickness

Claim 5 in the ‘480 Patent, and Claims 1-3 of the ‘292 Patent all include a requirement that the protected product have “substantially uniform thickness.” The Court defined this term as “a largely, but not necessarily wholly, uniform distance between the upper surface and the lower surface without significant deviations, protrusions or steps.” (ECF #54, in Case Number 12 CV 223). As set forth in the Court’s prior opinion, the terminology “without significant deviations, protrusions or steps” is an added limitation that the Court would not have adopted of its own accord. However, Plaintiff contended that the limitations were part of the definition as understood by the Patent Office and were necessary to overcome prior art and obviousness issues raised by that Office; and, the Defendants agreed to that interpretation. Therefore, the Court

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Furthermore, there is no evidence to suggest that a single layer adhesive would have worked in the same “way” as a double-sided adhesive in Plaintiff’s product because prior to the addition of the “edge feature” or “channel” off-set by the steps in the accused product, there would have been no means of containing the adhesive strictly to the underside of the product without the potential for some degree of spread.

adopted these limitations as part of the claim construction.

Now, this limitation, argued for by the Plaintiff during claim construction, is the center of Defendant's argument that their product does not infringe Plaintiff's patents. Defendant argues that its accused product, which indisputably has steps and a graduated taper along each lateral edge, contains significant deviations and steps, and, therefore, does not contain the element of "substantially uniform thickness" under the Court's construction. Thus, its product cannot infringe Claim 5 of the '480 Patent, or Claims 1-3 of the '292 Patent under the all-elements rule.

A. Literal Infringement

The parties do not dispute that the accused product contains steps along each lateral edge. As Mr. Lowe, the Managing Director of InSite attested in his Declaration, the underside of Defendant's product has a central recess, set between two steps, one on each lateral edge of the product. (ECF #59-1, Lowe Decl. § 8, in Case Number 12 CV 223). Further, the polymer layer has tapered edges that diminish the thickness of the layer from the full center thickness of 0.027" to an edge height of zero. The transitional radius of the tapered edge is 0.187", with a tapering angle of 22 degrees. (Lowe Decl. § 9). The inventor of the Plaintiff's patent, Thomas Goecke testified that the accused product has steps, and that these steps have a function, which is to create "a channel to where adhesive is applied." (Goecke Depo. At 168-169). He further testified that Defendant's product has a tapered edge where "the thickness of the profile changes," and that this tapered edge serves the purpose of helping skids "slide across it rather than catch on the edge." (*Id.* At 171-172).⁴ Even Plaintiff's expert, Dr. Serra, while opining that Defendant's product

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Mr. Goecke also testified that the actual product he sought to patent included a beveled

contained no “significant deviations, protrusions or steps” recognized the thickness deviations at the accused product’s edge.⁵ Further, during his deposition he acknowledged “the step” in the product. (ECF #19-1, Serra Depo. at 84, in Case Number 13 CV 572). Having reviewed all of the evidence presented by both sides, there is significant evidence from witnesses for both parties that the accused product had steps and a deviation in thickness. Further there is no evidence that would support a finding to the contrary, and the existence of the steps and thickness deviation (manifested as tapered edges) is obvious to any observer of the product’s specifications.

The question then becomes whether the steps and tapering are “significant” to the overall “uniform thickness” of the product, which is the only claim element limited by this terminology. Defendant has presented evidence attesting to the significance of the steps and the tapering, both in terms of height or thickness of the product, and in terms of the functionality of the product. As noted above, Mr. Goecke, the inventor of the patented product testified that the channel created by the steps on the accused product serves to create a channel to contain adhesive.⁶ He also testified that the tapered edge on the accused product served an important function by helping skids slide across the tape without catching. Mr. Goecke testified during his deposition that having a beveled (or tapered) edge served to help skids ride over the tape and make it “more

edge to assist in preventing skids from catching on the edge of the tape. (Goecke Depo. at 93-94). The element of a beveled edge, however, was admittedly not included in the patent or the patent application. (*Id.* at 93, 97).

⁵

Dr. Serra called the steps and tapering feature “an edge feature,” “shoulder,” and/or “recess” in various parts of his expert report. (ECF #20-1, in Case Number 13 CV 572).

⁶

The channel, which would contain adhesive and keep it from oozing out, is presumably what allowed the accused product to avoid the use of double-sided adhesive, an element in Claim 2 of the ‘480 Patent

likely [pallets] will glide over the top of it rather than catch on the edge.” (ECF #76-1, Goecke Depo. at 95-97, in Case Number 12 CV 223). He further indicated that in considering what he wanted in a floor marking tape, it was important that it “would have withstood impact from skids...” (Id. at 27).⁷ In addition, tapered edges were advertised as a benefit that would “eliminate potential tripping and impact hazards in connection with DuraStripe V tape, one of the earlier iterations of the patented product.

Mr. Lowe submitted a Declaration attesting to the functional significance of both the steps and the tapering on the polymer layer’s edges. He attested that the “recess, steps, radius and taper are structurally and functionally significant.” (ECF #51-1, ¶ 10, in Case Number 12 CV 223). He further described the function of the steps and the recess between as a means of “maintain[ing] the adhesive for securing the accused products to a floor, while preventing the adhesive from oozing out from beneath the products or raising the edge from the floor.” (Id. at ¶ 11). In addition, he described the steps as being of “significant size” comparative to the overall thickness of the product, being that the depth of the steps was 18.5% of the overall thickness of the polymer layer. (Id. at ¶ 12). Finally, Mr. Lowe described the significance of the steps and thickness deviation from tapering as follows:

The non-uniform nature of the polymer layer is significant for at least the reasons that (a) the steps and recess provide a container for the adhesive so that the area beneath the tapered edges can lie flat against the floor, without a layer of adhesive lifting them from the floor were they to be engaged by pallets, or equipment such as forklifts, (b) the 22° taper blends directly into the floor, with no flat abutting edge, helping to eliminate pallet dragging or equipment damage, and (c) the

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He also admitted that although he included this feature in his own product in order to serve the above function, this feature was not included in the patent. (ECF #76-1, Goecke Depo. at 95-97, in Case Number 12 CV 223).

radiused transition of 0.187" further accommodates overriding skids, pallets and equipment with minimal risk of damage.

(Id. at ¶ 13).

The '480 Patent itself also indicates the significance of creating a product with "improved tear resistance, strength and abrasion resistance" using a combination of "Shore A hardness, textured surface and layer thickness," (emphasis added). In so far as the recess created by the steps on the accused product also functioned to keep the tape flat against the floor without any raised edge created by adhesive, it also serves the same function of improving the tape's ability lay flat against the floor and to withstand traffic from skids and pallets. These statements all provide evidence that the function imported by the steps and tapering on the accused product is significant in so far as it allows the tape to lie flat with the floor and eliminates the potential for skids and pallets to catch on the edge of the tape. In addition, the steps have a depth that equals 18.5 % of the overall thickness of the polymer layer, which can be considered a significant size step relative to the overall thickness.

Plaintiff argues that the steps and tapering are not significant. In support of this argument it has submitted the expert report of Dr. Serra, in which he opines that the accused product is "without significant deviations, protrusions, or steps." (ECF #20-1 at 4, in Case Number 13 CV 572). The only support he offers for this opinion is his finding that the "edge features or opposed shoulder portions," which are the tapering and steps described above, "account for less than 1% of the overall area of the polymer layer," and "account for less than 1% of the overall weight of the polymer." (Id. at 5). The significance of a feature must be determined in the context of the element which is modified by that feature. In this case, the element is the thickness of the

product. Neither weight nor area specifications within the '480 or '292 Patents are modified by the phrase "without significant deviations, protrusions or steps."

This limitation applies only to the thickness of the product. Dr. Serra's report does not address the significance of the steps and tapering of the accused product relative to the overall thickness of the product.

Dr. Serra himself admitted in his deposition that the claim limitation at issue speaks to the thickness of the product; that thickness correlates to the cross-sectional height of the polymer; that a step is normally considered in context of height; and, that although he did measure the height of the steps on the accused product and used this in his calculations, he did not base his conclusions on the height of the steps. (ECF #19-1, Serra Depo, at 44-45, in Case Number 13 CV 572). Dr. Serra also admitted that he accepted and relied on Mr. Lowe's calculation that the height of the steps is 18.5% of the overall thickness of the accused product. (*Id.* at pg. 47). In addition, Dr. Serra testified that although he considered the functional significance of the steps "in his mind," he did not address functional significance in his report. (*Id.*). He did, however, understand that Mr. Lowe, whose testimony was provided by way of Declaration in support of Defendant's Motion for Summary Judgment, and was available prior to Dr. Serra's submission of his expert report, thought that the functionality of the steps was "quite significant." (*Id.*) Nonetheless, Dr. Serra did not choose to counter this conclusion, or otherwise address the issue in his expert report.

There is evidence before this Court that would show that both the steps and the tapering on the accused product are significant in both function and size (as compared to the overall

thickness of the product).⁸ Plaintiff has presented no evidence that would suggest that the steps and tapering are not significant with regard to function or relative to the thickness of the product. Instead they provided an expert report that draws the conclusion that the steps are not significant in relation to the overall weight and area of the product. The limitation of no “significant deviations, protrusions or steps,” however, does not relate to any claim element directed at the weight or overall area of the product. Therefore, Dr. Serra’s conclusion is not relevant to the issue the Court must address. In short, there is evidence to support Defendant’s position that the steps and tapering of the accused product are significant in relation to the thickness of the product, and in function; and, Plaintiff has offered no evidence to counter this argument in the relevant context of the thickness of the product.

Plaintiff offers additional arguments seeking to exclude consideration of the “edge features” when evaluating the alleged infringement of the accused product’s polymer layer, and also arguing that “[t]he presence of an additional ‘edge feature’ does not save a finding of infringement because the open-ended language ‘comprising’ permits such an additional feature.” (ECF #20, in Case No. 12 CV 223). The “edge feature” (comprising of the steps and tapered edge) is not a separate and distinct feature or element of the accused product. It is part and parcel of the polymer layer addressed in the Patent, and is distinguishable only by the variation in thickness that is also specifically addressed by the Patent language. The polymer layer is a single piece from edge to edge and in the accused product varies in thickness due to the steps and

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Because every element must be matched to find infringement, any aspect of the product that would exclude it from the claimed elements protects it from infringement. *See generally, TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc.*, 529 F.3d 1364, 1379 (Fed. Cir. 2008). In this case, significance in either size or functionality would be sufficient to meet the exclusion criteria of the claim language; there is evidence of both.

tapering. There is no separate piece or material added on to the sides of the polymer layer, and there is no basis for excluding the edge when considering whether the elements of the patent have been infringed. Further, any open-endedness implied by the word “comprised” in the Patents cannot override a specific exclusion or limitation described and included in the claim language, itself. Plaintiff cannot argue that a significant step or deviation is permitted by the open-ended language “comprised,” when the claim itself specifically excludes any product that contains significant steps or deviations. *See, Kustom Signals, Inc. v. Applied Concepts, Inc.*, 264 F.3d 1326, 1332 (Fed. Cir. 2001). Therefore, summary judgment in favor of the Defendant is warranted on the issue of literal non-infringement of Claim 5 of the ‘480 Patent, and Claims 1-3 of the ‘292 Patent.

B. Doctrine of Equivalents

Defendant has argued that Plaintiff is barred from asserting the doctrine of equivalents to establish infringement of Claim 5 of the ‘480 Patent because ShieldMark added the element “substantially uniform thickness” to its application, narrowing the scope of the original claim, in order to ensure patentability of its invention. The patent examiner in the prosecution of the ‘480 Patent raised concerns over the patentability of ShieldMark’s product, at least in part, due to the prior art contained in the Maurer patent (Patent 5,839,977). In order to defend its application, ShieldMark distinguished Maurer as disclosing “a stepped configuration where the thickness of the applique increases at each step.” ShieldMark also argued that Maurer would not meet the limitation of “substantially uniform thickness” within the ‘480 Patent because it “recites a tape including abruptly increasing thickness.” (ECF #59 at 8, in Case Number 12 CV 223). This, in

fact, was the reason Plaintiff argued that the claim construction of “substantially uniform thickness” should include the limitation “without substantial deviations, protrusions or steps” during the earlier proceedings in this case. As previously noted, this is not a limitation that the Court would have imposed on its own, based on the plain language of the claim, but it was adopted because the parties agreed that it was the intended construction based on Plaintiff’s arguments to the Patent office during the prosecution of the ‘480 Patent application. Plaintiff has not countered Defendant’s argument that prosecution history estoppel should bar the application of the doctrine of equivalents with regard to this claim element. Therefore, the doctrine of equivalents cannot be applied to prove infringement under the circumstances of this case.

CONCLUSION

For the reasons set forth above, the Defendant’s Motions for Summary Judgment of Non-Infringement (ECF # 58 in case number 1:12 CV 223, and ECF #16 in case number 1:13 CV 572), are hereby GRANTED. Judgment is entered in favor of Defendant, InSite, and these cases are dismissed. IT IS SO ORDERED.

/s/ Donald C. Nugent
Judge Donald C. Nugent
United States District Judge

Date: November 19, 2013

Suzanne Horvath

From: ohndecf@ohnd.uscourts.gov
nt: Wednesday, November 20, 2013 9:43 AM
to: OHNDdb_NEF@ohnd.uscourts.gov
Subject: Activity in Case 1:12-cv-00223-DCN Shieldmark, Inc. v. Insite Solutions, LLC Order on Motion for summary judgment

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Northern District of Ohio

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Case Name: Shieldmark, Inc. v. Insite Solutions, LLC

Case Number: 1:12-cv-00223-DCN

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WARNING: CASE CLOSED on 11/20/2013

Document Number: 92

cket Text:

Memorandum Opinion and Order granting defendant's Motion for summary judgment (Related Doc # [58]) and (Related Doc # [16]) in case number 1:13 CV572. Judgment is entered in favor of Defendant, InSite, and these cases are dismissed. Judge Donald C. Nugent(C,KA)

1:12-cv-00223-DCN Notice has been electronically mailed to:

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12f23c8a86f68a1523d76921a5f2dd8e0c6ffb75b86f1dc4aab7ea9f5139]]

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
EASTERN DIVISION

SHIELDMARK, INC.,

Plaintiff,

V.

INSITE SOLUTIONS, LLC.

Defendant.

)
) CASE NO.: 1:12 CV 223
) 1:13 CV 572
)
) JUDGE DONALD C. NUGENT
)
)
)
) JUDGMENT ORDER
)

For the reasons set forth in this Court's Memorandum Opinion and Order, the Defendant's Motions for Summary Judgment of Non-Infringement (ECF # 58 in case number 1:12 CV 223, and ECF #16 in case number 1:13 CV 572), are hereby GRANTED. Judgment is entered in favor of Defendant, InSite, and these cases are dismissed. IT IS SO ORDERED.

/s/ Donald C. Nugent
Judge Donald C. Nugent
United States District Judge

Date: November 19, 2013

(12) **United States Patent**
Goecke

(10) **Patent No.:** **US 8,088,480 B2**
(45) **Date of Patent:** **Jan. 3, 2012**

(54) **ADHESIVE TAPE**

(75) Inventor: **Thomas R. Goecke**, Rocky River, OH
(US)

(73) Assignee: **Shieldmark, Inc.**, Rocky River, OH
(US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1013 days.

(21) Appl. No.: **10/674,108**

(22) Filed: **Sep. 29, 2003**

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C09J 7/02 (2006.01)

B32B 7/12 (2006.01)

(52) **U.S. Cl.** **428/343**; 428/141; 428/332; 428/337;
428/906

(58) **Field of Classification Search** 428/40.1,
428/40.6, 41.3, 41.6, 42.1, 207, 343, 354,
428/217, 908.8, 40.8, 141, 174, 332, 337,
428/906

See application file for complete search history.

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Primary Examiner — Patricia Nordmeyer

(74) *Attorney, Agent, or Firm* — Brennan, Manna & Diamond

(57) **ABSTRACT**

The adhesive tape of this application comprises a layer of polymeric material, particularly a polyvinyl chloride, having a Shore A Hardness of between 92 and 100 and a layer of adhesive material attached to a surface of the layer of polymeric material.

13 Claims, 1 Drawing Sheet

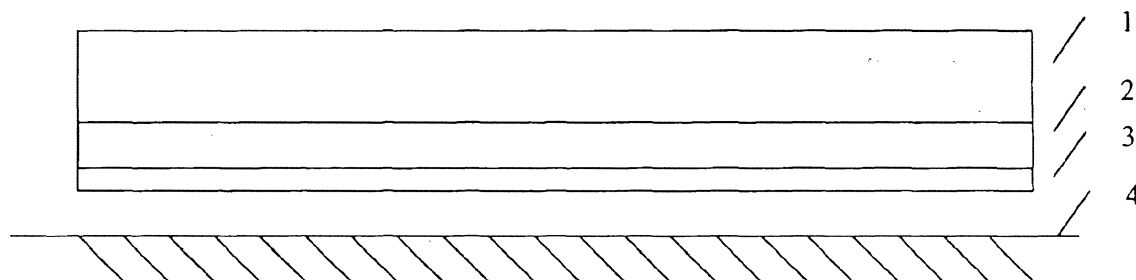
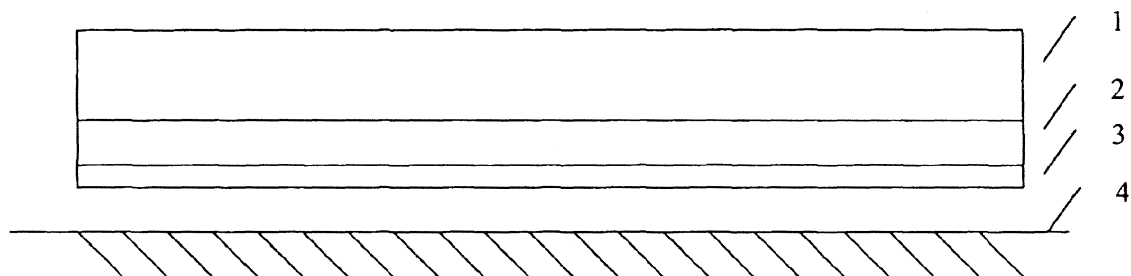


FIGURE 1



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ADHESIVE TAPE

BACKGROUND

This invention relates to an adhesive tape having superior ductility, strength, tear resistance and abrasion resistance, particularly a pressure sensitive adhesive. Polymeric pressure sensitive adhesive tapes are economical and adaptable to many different applications. One primary example is as floor marking in industrial and factory environments. However, there are several disadvantages to using such tape in industrial settings. One disadvantage is that the tape lacks sufficient strength and hardness to prevent wearing, tearing, cracking and breakage from heavy and repeated traffic, such as from forklift trucks. Similarly, as a result of poor adhesive quality, repeated traffic has a tendency to detach many commercially available tapes from the floor. Another disadvantage is that the aesthetic qualities and physical properties of the tape are diminished from scuffing, scratching, and the like. Such disadvantages plague existing polymeric pressure sensitive adhesive tapes. Because of these disadvantages that have been associated with polymeric pressure sensitive adhesive tape, wide industry acceptance has been historically difficult to achieve. Accordingly, many opt to rely on the time consuming and exacting practice of painting.

In view of the above discussion, it is an advantage of the present invention to provide a polymeric adhesive tape that has superior ductility, strength, tear resistance and abrasion resistance. Other advantages of the present invention will be apparent from the following detailed description.

SUMMARY OF INVENTION

According to one embodiment, an adhesive tape is provided. The tape has a first layer of polymeric material having a Shore A Hardness of between 92 and 100 and a thickness of between 0.020" and 0.065", and a second layer of adhesive. Preferably, the adhesive is of a pressure sensitive type.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cross-sectional view illustrating the embodiment of a polymeric pressure sensitive adhesive tape.

DETAILED DESCRIPTION OF THE INVENTION

The adhesive tape of this invention usually comprises a layer of polymeric material and at least one layer of adhesive material. The pressure-sensitive adhesive tape of this invention is not limited to having only the above layers of polymeric material and layer of pressure-sensitive adhesive material. It may optionally have an additional layer, such as a laminating substrate on an outermost side of the above adhesive layer. The laminating substrate is usually peeled off and thrown away when pressure-sensitive adhesive tape is actually used. Therefore, inexpensive materials are preferred, however, there are no particular limitations on the materials used for the laminating substrate.

FIG. 1 is an example of the pressure-sensitive adhesive tape of this invention wherein a layer of polymeric material (1) is attached to the top side of a layer of pressure-sensitive adhesive material (2) and a laminating substrate (3) is attached to the bottom side of the pressure-sensitive adhesive material. Upon removal of the laminating substrate (3), the tape can be applied to a floor (4) with the application of pressure.

The pressure-sensitive adhesive tape of this invention can be produced in a variety of lengths, widths, and thickness. A

variety of colors can also be used for the outer surface of the layer of polymeric material (1). For example, safety yellow can be used for aisle markings, or red can be used for quarantine and reject markings in a production facility. Coloring can be achieved by introducing a colorant in any form, including pigments and dyes into the polymeric material.

The adhesive employed in layer material (3) may be any of those heretofore employed in the art for preparing adhesive structures. By way of illustration, suitable adhesives of this general description include those disclosed in U.S. Pat. No. 5,061,559, herein incorporated by reference.

The layer of polymeric material (1) may be a durable polymer such as polyvinyl chloride, polycarbonate, or a terpolymer comprised of acrylonitrile, butadiene and styrene or the like. A clear or tinted polyvinyl chloride is a preferred material. The polymer selected must have Shore A Hardness between, for example, 92-100, and preferably between 93-97. The outer surface of the layer of polymeric material (1) is preferably textured. The layer of polymeric material (1) may have a thickness of about, for example, 0.020" to 0.065".

Advantageously, this embodiment of the invention provides improved tear resistance, strength, and abrasion resistance by employing the sum or all of the combination of polymer selected, Shore A Hardness, textured surface, and layer thickness.

EXAMPLES

One embodiment of the invention will be described below in greater detail through the following examples.

Test samples were performed on a 4" wide sample of the pressure sensitive adhesive tape of this invention. The example tape was constructed of a semi-rigid 95A polyvinyl chloride from Artemis Industries, 2550 Gilcrest Rd, Akron Ohio 44305 which was extruded from a 2½" diameter NRM extrusion machine at 360-380° F. at an extrusion rate of 400 ft per hour to yield a 0.065 thick, 4" wide layer. A textured first surface of the extruded polymer layer was achieved by following the above process parameters. During extrusion a rubberized double sided carpet tape (Product #591B) from International Tape Co., P.O. Box 240, 6 Industrial Drive, Windham, N.H. 03087 was applied to a second side of the extruded polymer layer. A tape from Windmill Tapes of Great Britain (www.windmilltapes.com) was used for comparison purposes. Test samples were conditioned at 73±3° F. and 50±5% relative humidity for at least 24 hours prior to testing.

Tensile strength at yield point was determined according to ASTM D 882 testing method. A 0.5"×8" sample was prepared and placed in the jaws of the instrument at a separation of 4.0". The tester was started at a separation rate of 2.0 in/min. At the instance the tape yielded the force was recorded. Five replicates of each sample were conducted and the results were normalized to pounds per inch width. Results indicate higher yield point and higher absolute forces involved at yield point for the pressure sensitive adhesive tape of this invention. Particularly, the yield point in both machine and traverse direction were respectively, on average, 3,176 lb/in² and 3,136 lb/in².

Tear resistance was determined according to the ASTM D 1004 test method. The samples were die cut according to the method. The liner from the sample was removed and the sample was placed in the jaws of the tester at a separation of one inch. The tester was started at a rate of 2.0 in/min. The maximum force encountered during testing was recorded. Five replicates of each sample in both the machine and traverse direction were tested. Results indicate substantially improved tear strength in both the machine and traverse direc-

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tions for the pressure sensitive adhesive tape of this invention. Particularly, the tear strength in both machine and traverse direction was respectively, on average, 22.3 lb and 22.1 lb.

Caliper or thickness was determined according to the PSTC-33 method. Caliper of the material was determined both with and without the liner. Ten replicates of each sample were measured. Results indicate substantially increased thickness of the pressure sensitive adhesive tape of this invention, partly because of the inherent characteristics of the semi-rigid surface. Particularly, the thickness of the material, with and without the liner, was respectively, on average, 68.4 mil and 65.4 mil.

Peel adhesion was tested according to a modified PSTC-101D method. The modification included dwell time. Peel adhesion is a measure of the strength of the adhesive bond between the tape and the test surface. Exactly one (1.0) inch wide samples were applied to a standard stainless steel test panel at a rate of 24 in/min with a 4.5 pound rubber covered roller according to the method. The tape was then peeled from the substrate at a 90° angle after a dwell time of one hour. The force required for removal was measured. Five replicates of each sample were tested. Results indicate substantially increased peel adhesion for the pressure sensitive adhesive tape of this invention when applied to stainless steel. Particularly, the peel adhesion of this material was, on average, 5.2 lb/in width.

Abrasion resistance was determined according to a modified ASTM D 5264 test method. The material was cut to a 2.5"x6" size. A new 2"x4" piece of standard A-5 receptor material (moderate abrasive) from Gavarti Associates Ltd. was affixed with double-sided tape to the four pound instrument weight (0.5 lb/in² load). This in turn was placed over the test sample. The instrument was set for 100 strokes and operation was initiated. The instrument strikes an arc with the abrasive over the test material. Each stroke consists of one motion back and forth over the sample. When the cycles were completed the weighted abrasive was lifted and the test sample removed. At the conclusion of the test the overall quality of each sample was evaluated relatively for scratch resistance. Results indicate that the abrasion resistance of the pressure sensitive adhesive tape of this invention is improved over the comparative tape.

Results obtained were as follows:

	Average	σ (standard deviation)	N (test numbers)
Tensile at Yield at 2.0 in/min, lb/in ²			
Inventive Sample Machine Direction	3,176	152	5
Inventive Sample Traverse Direction	3,136	56	5
Comparative Sample Machine Direction	2,400	160	5
Comparative Sample Traverse Direction	1,720	120	5
Tear at 2.0 in/min, lb.			
Inventive Sample Machine Direction	22.3	1.6	5
Inventive Sample Traverse Direction	22.1	0.4	5
Comparative Sample Machine Direction	2.2	0.1	5
Comparative Sample Traverse Direction	1.6	0.1	5
Caliper, mil.			
Inventive Sample With Liner	68.4	0.5	10
Inventive Sample Without Liner	65.4	0.5	10
Comparative Sample	5.5	0.04	10
Adhesion to Stainless lb/in width			

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-continued

	Average	σ (standard deviation)	N (test numbers)
Inventive Sample	5.2	0.5	5
Comparative Sample	1.7	0.03	5
Abrasion Resistance			
Inventive Sample	Excellent - no sign of damage		
Comparative Sample	Fair - moderate damage		

Since certain changes may be made without departing from the scope of the invention herein involved, it is intended that all matter described in the foregoing description, including the examples, shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. An adhesive tape comprising:

a polymer having a Shore A Hardness of between 92 and 100; and

a layer of pressure sensitive adhesive comprising a first side and an opposed second side, the first side being in direct and uninterrupted contact with the polymer layer where the adhesive tape comprises an average thickness between 65 mil and 69 mil.

2. An adhesive tape for application to a flooring environment comprising:

a polymer layer having a thickness between 0.020" and 0.065", the polymer layer defining a first side; and a double sided adhesive layer where one side of the double sided adhesive layer is in substantially continuous contact with the first side of the polymer layer and an opposing side of the double sided adhesive layer is disposed to adhere to the flooring environment;

where the adhesive tape has a peel adhesion greater than 2.0 lb/in width, measured under a test method including peeling the tape at a 90 degree angle after application to a stainless steel panel.

3. The adhesive tape as set forth in claim 2, wherein the test method further includes peeling the tape at a 90 degree angle after application to a stainless steel panel and allowing a dwell of one hour.

4. The adhesive tape as set forth in claim 2, further comprising a substantially planar floor adhered to the adhesive on the opposing side, where the adhesive tape provides an aisle marking system.

5. An adhesive tape comprising:

a polymer layer having a Shore A Hardness of between 92 and 100 and a substantially uniform thickness of between about 0.020" to 0.065"; and

a layer of adhesive attached to said polymer layer; where the adhesive tape comprises a peel adhesion greater than 2.0 lb/in width when peeled at a 90 degree angle under a modified PSTC-101 method where the modified PSTC-101 method comprises a dwell time of one hour.

6. The adhesive tape of claim 5, further comprising a substrate attached to an outermost side of said layer of adhesive.

7. The adhesive tape claim of claim 5, wherein said polymer layer includes a textured surface.

8. The adhesive tape of claim 5, wherein said polymer layer is comprised of a polyvinyl chloride.

9. The adhesive tape of claim 8, wherein said polyvinyl chloride comprises a clear polymer.

10. The adhesive tape of claim 5, wherein said polymer layer includes coloring pigment.

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11. The adhesive tape of claim 5, wherein said adhesive comprises a rubberized double-sided tape.

12. The adhesive tape of claim 5, the adhesive tape claim of claim 1, wherein said polymer layer has a Shore A Hardness of between about 93 and 97.

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13. The adhesive tape of claim 5, wherein said adhesive is pressure sensitive.

* * * * *

(12) **United States Patent**
Goecke

(10) **Patent No.:** **US 8,343,292 B1**
(45) **Date of Patent:** **Jan. 1, 2013**

(54) **ADHESIVE TAPE**

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See application file for complete search history.

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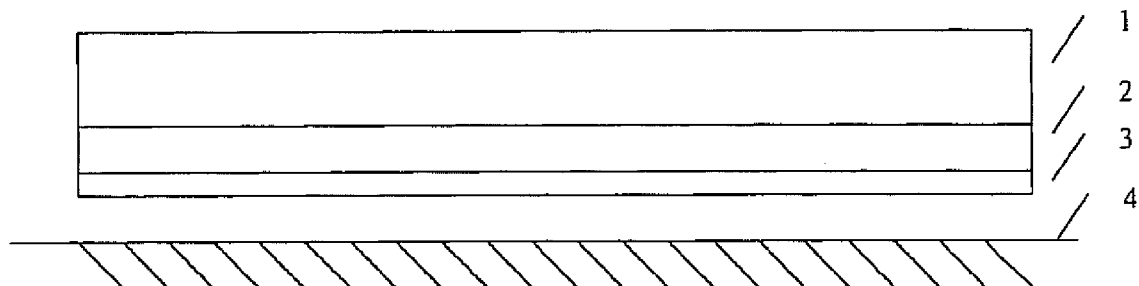
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(57) **ABSTRACT**

The pressure sensitive adhesive tape of this invention com-
prises a first layer of polymeric material, particularly a poly-
vinyl chloride, having a Shore A Hardness of between 92 and
100 and a second layer of adhesive material attached to a
surface of the layer of polymeric material.

11 Claims, 1 Drawing Sheet



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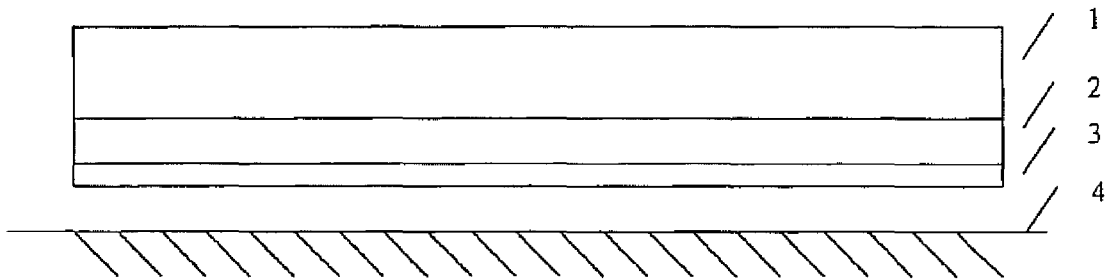
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ADHESIVE TAPE

RELATED APPLICATION

This application is a continuation of and claims priority to application Ser. No. 10/674,108 filed Sep. 29, 2003.

BACKGROUND

This invention relates to an adhesive tape having superior ductility, strength, tear resistance and abrasion resistance, particularly a pressure sensitive adhesive. Polymeric pressure sensitive adhesive tapes are economical and adaptable to many different applications. One primary example is as floor marking in industrial and factory environments. However, there are several disadvantages to using such tape in industrial settings. One disadvantage is that the tape lacks sufficient strength and hardness to prevent wearing, tearing, cracking and breakage from heavy and repeated traffic, such as from forklift trucks. Similarly, as a result of poor adhesive quality, repeated traffic has a tendency to detach many commercially available tapes from the floor. Another disadvantage is that the aesthetic qualities and physical properties of the tape are diminished from scuffing, scratching, and the like. Such disadvantages plague existing polymeric pressure sensitive adhesive tapes. Because of these disadvantages that have been associated with polymeric pressure sensitive adhesive tape, wide industry acceptance has been historically difficult to achieve. Accordingly, many opt to rely on the time consuming and exacting practice of painting.

In view of the above discussion, it is an advantage of the present invention to provide a polymeric adhesive tape that has superior ductility, strength, tear resistance and abrasion resistance. Other advantages of the present invention will be apparent from the following detailed description.

SUMMARY OF INVENTION

According to one embodiment, an adhesive tape is provided. The tape has a first layer of polymeric material having a Shore A Hardness of between 92 and 100 and a thickness of between 0.020" and 0.065", and a second layer of adhesive. Preferably, the adhesive is of a pressure sensitive type.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cross-sectional view illustrating the embodiment of a polymeric pressure sensitive adhesive tape.

DETAILED DESCRIPTION OF THE INVENTION

The adhesive tape of this invention usually comprises a layer of polymeric material and at least one layer of adhesive material. The pressure-sensitive adhesive tape of this invention is not limited to having only the above layers of polymeric material and layer of pressure-sensitive adhesive material. It may optionally have an additional layer, such as a laminating substrate on an outermost side of the above adhesive layer. The laminating substrate is usually peeled off and thrown away when pressure-sensitive adhesive tape is actually used. Therefore, inexpensive materials are preferred, however, there are no particular limitations on the materials used for the laminating substrate.

FIG. 1 is an example of the pressure-sensitive adhesive tape of this invention wherein a layer of polymeric material (1) is attached to the top side of a layer of pressure-sensitive adhesive material (2) and a laminating substrate (3) is attached to

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the bottom side of the pressure-sensitive adhesive material. Upon removal of the laminating substrate (3), the tape can be applied to a floor (4) with the application of pressure.

The pressure-sensitive adhesive tape of this invention can be produced in a variety of lengths, widths, and thickness. A variety of colors can also be used for the outer surface of the layer of polymeric material (1). For example, safety yellow can be used for aisle markings, or red can be used for quarantine and reject markings in a production facility. Coloring can be achieved by introducing a colorant in any form, including pigments and dyes into the polymeric material.

The adhesive employed in layer material (3) may be any of those heretofore employed in the art for preparing adhesive structures. By way of illustration, suitable adhesives of this general description include those disclosed in U.S. Pat. No. 5,061,559, herein incorporated by reference.

The layer of polymeric material (1) may be a durable polymer such as polyvinyl chloride, polycarbonate, or a terpolymer comprised of acrylonitrile, butadiene and styrene or the like. A clear or tinted polyvinyl chloride is a preferred material. The polymer selected must have Shore A Hardness between, for example, 92-100, and preferably between 93-97. The outer surface of the layer of polymeric material (1) is preferably textured. The layer of polymeric material (1) may have a thickness of about, for example, 0.020" to 0.065".

Advantageously, this embodiment of the invention provides improved tear resistance, strength, and abrasion resistance by employing the sum or all of the combination of polymer selected, Shore A Hardness, textured surface, and layer thickness.

EXAMPLES

One embodiment of the invention will be described below in greater detail through the following examples.

Test samples were performed on a 4" wide sample of the pressure sensitive adhesive tape of this invention. The example tape was constructed of a semi-rigid 95A polyvinyl chloride from Artemis Industries, 2550 Gilcrest Rd, Akron Oh 44305 which was extruded from a 2&1/2" diameter NRM extrusion machine at 360-380° F. at an extrusion rate of 400 ft per hour to yield a 0.065 thick, 4" wide layer. A textured first surface of the extruded polymer layer was achieved by following the above process parameters. During extrusion a rubberized double sided carpet tape (Product #591B) from International Tape Co., P.O. Box 240, 6 Industrial Drive, Windham, N.H. 03087 was applied to a second side of the extruded polymer layer. A tape from Windmill Tapes of Great Britain (www.windmilltapes.com) was used for comparison purposes. Test samples were conditioned at 73±3° F. and 50±5% relative humidity for at least 24 hours prior to testing.

Tensile strength at yield point was determined according to ASTM D 882 testing method. A 0.5"×8" sample was prepared and placed in the jaws of the instrument at a separation of 4.0". The tester was started at a separation rate of 2.0 in/min. At the instance the tape yielded the force was recorded. Five replicates of each sample were conducted and the results were normalized to pounds per inch width. Results indicate higher yield point and higher absolute forces involved at yield point for the pressure sensitive adhesive tape of this invention. Particularly, the yield point in both machine and traverse direction were respectively, on average, 3,176 lb/in² and 3,136 lb/in².

Tear resistance was determined according to the ASTM D 1004 test method. The samples were die cut according to the method. The liner from the sample was removed and the sample was placed in the jaws of the tester at a separation of

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one inch. The tester was started at a rate of 2.0 in/min. The maximum force encountered during testing was recorded. Five replicates of each sample in both the machine and traverse direction were tested. Results indicate substantially improved tear strength in both the machine and traverse directions for the pressure sensitive adhesive tape of this invention. Particularly, the tear strength in both machine and traverse direction was respectively, on average, 22.3 lb and 22.1 lb.

Caliper or thickness was determined according to the PSTC-33 method. Caliper of the material was determined both with and without the liner. Ten replicates of each sample were measured. Results indicate substantially increased thickness of the pressure sensitive adhesive tape of this invention, partly because of the inherent characteristics of the semi-rigid surface. Particularly, the thickness of the material, with and without the liner, was respectively, on average, 68.4 mil and 65.4 mil.

Peel adhesion was tested according to a modified PSTC-101D method. The modification included dwell time. Peel adhesion is a measure of the strength of the adhesive bond between the tape and the test surface. Exactly one (1.0) inch wide samples were applied to a standard stainless steel test panel at a rate of 24 in/min with a 4.5 pound rubber covered roller according to the method. The tape was then peeled from the substrate at a 90° angle after a dwell time of one hour. The force required for removal was measured. Five replicates of each sample were tested. Results indicate substantially increased peel adhesion for the pressure sensitive adhesive tape of this invention when applied to stainless steel. Particularly, the peel adhesion of this material was, on average, 5.2 lb/in width.

Abrasion resistance was determined according to a modified ASTM D 5264 test method. The material was cut to a 2.5"×6" size. A new 2"×4" piece of standard A-5 receptor material (moderate abrasive) from Gavarti Associates Ltd. was affixed with double-sided tape to the four pound instrument weight (0.5 lb/in² load). This in turn was placed over the test sample. The instrument was set for 100 strokes and operation was initiated. The instrument strikes an arc with the abrasive over the test material. Each stroke consists of one motion back and forth over the sample. When the cycles were completed the weighted abrasive was lifted and the test sample removed. At the conclusion of the test the overall quality of each sample was evaluated relatively for scratch resistance. Results indicate that the abrasion resistance of the pressure sensitive adhesive tape of this invention is improved over the comparative tape.

Results obtained were as follows:

	Average	σ (standard deviation)	N (test numbers)
Tensile at Yield at 2.0 in/min, lb/in²			
Inventive Sample Machine Direction	3,176	152	5
Inventive Sample Traverse Direction	3,136	56	5
Comparative Sample Machine Direction	2,400	160	5
Comparative Sample Traverse Direction	1,720	120	5
Tear at 2.0 in/min, lb.			
Inventive Sample Machine Direction	22.3	1.6	5
Inventive Sample Traverse Direction	22.1	0.4	5
Comparative Sample Machine Direction	2.2	0.1	5
Comparative Sample Traverse Direction	1.6	0.1	5

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-continued

	Average	σ (standard deviation)	N (test numbers)
5 Caliper, mil.			
Inventive Sample With Liner	68.4	0.5	10
Inventive Sample Without Liner	65.4	0.5	10
Comparative Sample	5.5	0.04	10
10 Adhesion to Stainless lb/in width			
Inventive Sample	5.2	0.5	5
Comparative Sample	1.7	0.03	5
15 Abrasion Resistance			
Inventive Sample	Excellent—no sign of damage		
Comparative Sample	Fair—moderate damage		

Since certain changes may be made without departing from the scope of the invention herein involved, it is intended that all matter described in the foregoing description, including the examples, shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A method of providing an adhesive polymer marking system comprising:

Extruding at least one polymer material to yield a polymer layer having a Shore A Hardness of between 92 and 100 and a substantially uniform thickness between 20 mil and 65 mil; and

Applying a layer of adhesive to the extruded polymer layer, with the adhesive being in direct and uninterrupted contact with the extruded polymer layer, where the adhesive polymer marking system has a peel adhesion greater than 2.0 lb/in width, measured under a test method including peeling the tape at a 90 degree angle after application to a stainless steel panel.

2. The method of providing an adhesive polymer marking system as set forth in claim 1, wherein the test method further includes peeling the tape at a 90 degree angle after application to a stainless steel panel and allowing a dwell of one hour.

3. The method of providing an adhesive polymer marking system as set forth in claim 1, further comprising adhering the extruded polymer layer to a substantially planar floor, where the adhered extruded polymer layer provides an adhesive polymer marking system.

4. A method of making an adhesive polymer marking system comprising:

Extruding at least one polymer material to yield a polymer layer having a Shore A Hardness of between 92 and 100 and an average thickness between 20 mil and 65 mil;

Texturing at least one surface of the polymer layer; and Applying a layer of adhesive to the extruded polymer layer on a side opposite the at least one surface, with the adhesive being in direct and uninterrupted contact with the extruded polymer layer,

where the adhesive polymer marking system has a tensile strength at yield point when tested under ASTM D 882 testing method greater than 3000 lb/in².

5. The method of providing an adhesive polymer marking system as set forth in claim 4, further comprising adhering the extruded polymer layer to a substantially planar floor, where the adhered extruded polymer layer provides an adhesive polymer marking system.

6. A method of providing an adhesive polymer marking system comprising:

Extruding at least one polymer material to yield a polymer layer having a Shore A Hardness of between 92 and 100;

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Applying a layer of adhesive to the extruded polymer layer
on a side opposite the at least one surface, with the
adhesive being in direct and uninterrupted contact with
the extruded polymer layer,
where the adhesive polymer marking system has a thick-
ness between 65 mil and 69 mil and tear resistance in
both machine and traverse directions greater than 22 lb.
7. The method of providing an adhesive polymer marking
system as set forth in claim 6, further comprising attaching a
substrate attached to an outermost side of the layer of adhe-
sive.
8. The method of providing an adhesive polymer marking
system as set forth in claim 6, further comprising texturing the
extruded polymer layer.

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9. The method of providing an adhesive polymer marking
system as set forth in claim 6, where the extruding comprises
extruding a polyvinyl chloride to yield a polymer layer having
a Shore A Hardness of between 92 and 100.
10. The method of providing an adhesive polymer marking
system as set forth in claim 6, where the applying comprises
applying a rubberized double-sided tape.
11. The method of providing an adhesive polymer marking
system as set forth in claim 6, where the extruding comprises
extruding a polymer to yield a polymer layer having a Shore
A Hardness between about 93 and 97.

* * * * *